HIP III HANDBOOK

Abbreviated Guidance of General and Specific Conservation Measures, Biological Opinion Requirements and RRT Guidance

Version 2.9

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Introduction.

This handbook represents a concise summary of the requirements of two biological opinions (BOs) issued by the United States Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS) on the effects of BPA's Habitat Improvement Program (HIP III).

> National Marine Fisheries Service. 2013. Endangered Species Act Section 7 Formal Programmatic Biological and Conference Opinion, Letter of Concurrence, and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation for Bonneville Power Administration's Habitat Improvement Program III (HIP III) KEC-4
>
> U.S. Fish and Wildlife Service. 2013. Formal section 7 programmatic consultation on BPA's Columbia River Basin Habitat Improvement Program. Oregon Fish and Wildlife Office, Portland, Oregon. TAILS no. 01EOFW00-2013-F-0199.

The categories of action presented in this handbook represent construction related activities within the **Fish Passage Restoration** and the **River, Stream, Floodplain and Wetland Restoration** activity categories only**.** Please refer to the BOs for information on other activity categories (such as invasive weed treatments and water delivery management actions) not mentioned here.

For USFWS terrestrial species, species-specific conservation measures may apply. Please contact your Environmental Compliance Lead (EC lead) for additional requirements.

If at any time there are uncertainties in implementing or interpreting the Conservation Measures listed in this document, the project sponsor, in conjunction with BPA staff, and if necessary the Restoration Review Team (RRT), will coordinate with the Services to address these concerns and resolve any outstanding issues.

Links to both BOs and This document:

http://efw.bpa.gov/environmental_services/endangeredspecies.aspx

Variance Requests.

Because of the wide range of proposed activities and the natural variability within and between stream systems, BPA (on behalf of the applicant) may require variances from criteria specified herein. The Services will consider granting variances, especially when there is a clear conservation benefit or there are no additional adverse effects (especially incidental take) beyond that analyzed in the BOs. Contact your EC lead for more information.

Variance requests shall be made on the Project Notification Form, which shall then be submitted to and approved by the Services via email correspondence.

1) Define the requested variance and the relevant criterion.
2) Environmental conditions during when the action takes place (flow and weather).
3) Biological justification as to why a variance is necessary and a brief rationale why the variance will either provide a conservation benefit or, at a minimum, not cause additional adverse effects beyond the scope of the Opinion
4) Include as attachments any necessary approvals by state agencies.

Variances must be authorized by both the NMFS Branch Chief and USFWS Field Office Supervisor. If the Services do not approve a request for variance, the project sponsor and BPA will initiate individual Section 7 consultation with USFWS and/or NMFS on the identified action.

HIP III BO Categories of Action.

Found in this Handbook

1. Fish Passage Restoration.

Profile Discontinuities.

a. Dams, Water Control or Legacy Structure Removal.
b. Consolidate, or Replace Existing Irrigation Diversions.
c. Headcut and Grade Stabilization.
d. Low Flow Consolidation.
e. Providing Fish Passage at an Existing Facility.

Transportation Infrastructure.

f. Bridge and Culvert Removal or Replacement.
g. Bridge and Culvert Maintenance.
h. Installation of Fords.

2. River, Stream, Floodplain, and Wetland Restoration.

a. Improve Secondary Channel and Wetland Habitats.
b. Set-back or Removal of Existing, Berms, Dikes, and Levees.
c. Protect Streambanks Using Bioengineering Methods.
d. Install Habitat-Forming Natural Material Instream Structures (Large Wood, Boulders, and Spawning Gravel).
e. Riparian Vegetation Planting.
f. Channel Reconstruction.

Not in this Handbook

3. Invasive and Non-Native Plant Control.

a. Manage Vegetation using Physical Controls.
b. Manage Vegetation using Herbicides.

4. Piling Removal.

5. Road and Trail Erosion Control, Maintenance, and Decommissioning.

a. Maintain Roads.
b. Decommission Roads.

6. In-channel Nutrient Enhancement.

7. Irrigation and Water Delivery/Management Actions.

a. Convert Delivery System to Drip or Sprinkler Irrigation.
b. Convert Water Conveyance from Open Ditch to Pipeline or Line Leaking Ditches or Canals.
c. Convert from Instream Diversions to Groundwater Wells for Primary Water Sources.
d. Install or Replace Return Flow Cooling Systems.
e. Install Irrigation Water Siphon Beneath Waterway.
f. Livestock Watering Facilities.
g. Install New or Upgrade/Maintain Existing Fish Screens.

8. Fisheries, Hydrologic, and Geomorphologic Surveys.

9. Special Actions (for Terrestrial Species).

a. Install/develop Wildlife Structures.
b. Fencing construction for Livestock Control
c. Implement Erosion Control Practices.
d. Plant Vegetation.
e. Tree Removal for LW Projects.

ESA-Listed Species Covered Under HIPIII.

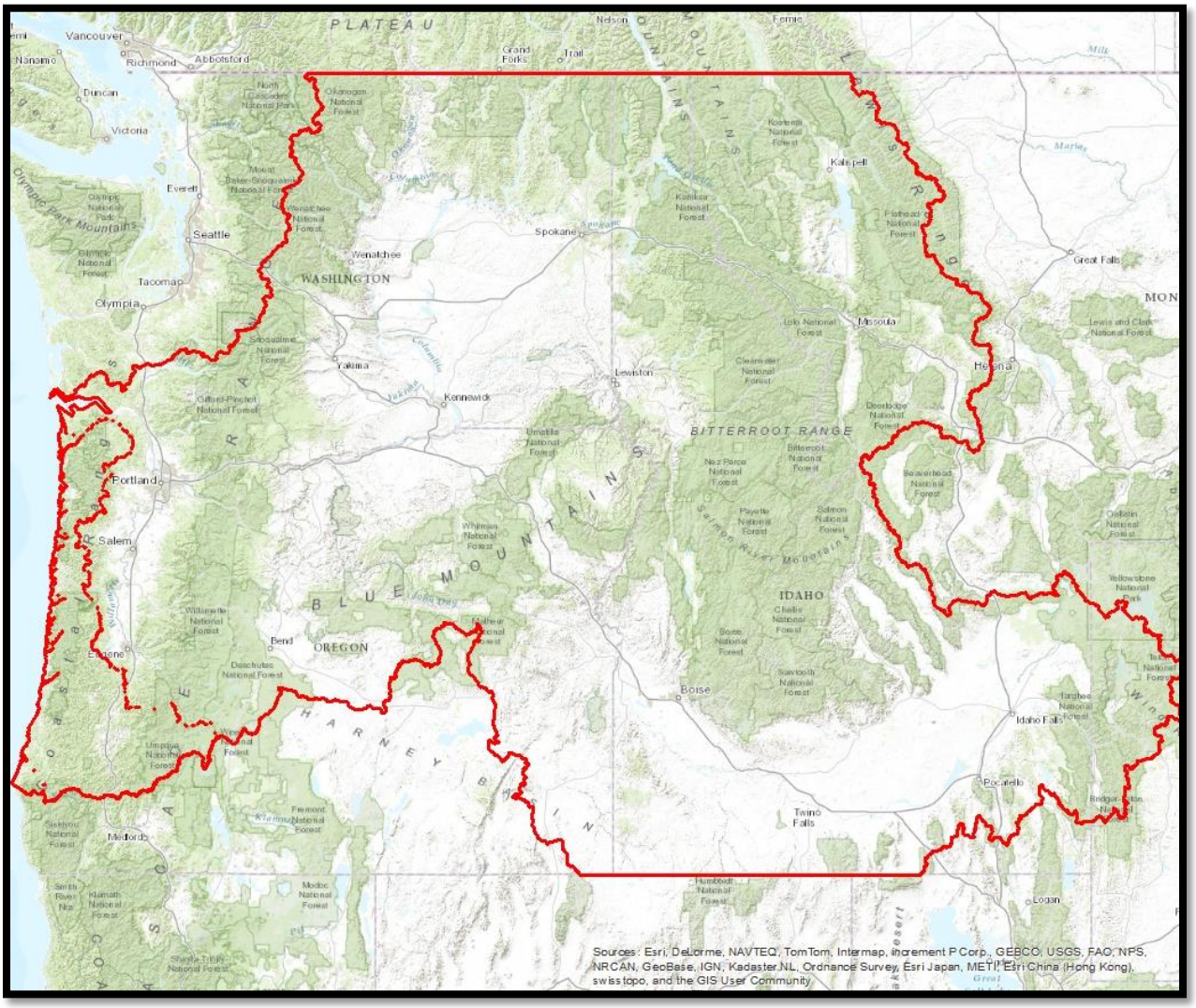
ANADROMOUS SALMONIDS	
Lower Columbia River Chinook salmon	*Oncorhynchus tshawytscha*
Upper Willamette River spring-run Chinook salmon	*Oncorhynchus tshawytscha*
Upper Columbia River spring-run Chinook salmon	*Oncorhynchus tshawytscha*
Snake River spring/summer-run Chinook salmon	*Oncorhynchus tshawytscha*
Snake River fall-run Chinook salmon	*Oncorhynchus tshawytscha*
Columbia River chum salmon	*Oncorhynchus keta*
Lower Columbia River coho salmon	*Oncorhynchus kistuch*
Oregon Coast coho salmon	*Oncorhynchus kistuch*
Snake River sockeye salmon	*Oncorhynchus nerka*
Lower Columbia River steelhead	*Oncorhynchus mykiss*
Upper Willamette River steelhead	*Oncorhynchus mykiss*
Middle Columbia River steelhead	*Oncorhynchus mykiss*
Upper Columbia River steelhead	*Oncorhynchus mykiss*
Snake River Basin steelhead	*Oncorhynchus mykiss*
ANADROMOUS FISHERIES	
Pacific Eulachon	*Thaleichthys pacificus*
Green Sturgeon	*Acipenser medirostris*
FRESHWATER FISH	
Bull Trout	*Salvelinus confluentus*
MAMMALS	
Canada lynx	*Lynx canadensis*
Columbia White-tailed Deer	*Odocoileus virginianus leucurus*
Gray wolf	*Canis lupus*
Grizzly Bear	*Ursus arctos horribilis*
North American wolverine	*Gulo gulo luscus*
Northern Idaho ground squirrel	*Spermophilus brunneus brunneus*
Pygmy rabbit	*Brachylagus idahoensis*
Woodland caribou	*Rangifer tarandus caribou*
BIRDS	
Marbled murrelet	*Brachyramphus marmoratus*
Northern spotted owl	*Strix occidentalis caurina*
Streaked horned lark	*Eremophila alpestris strigata*
Western snowy plover	*Charadrius alexandrinus nivosus*
INVERTEBRATES	
Banbury Springs limpet	*Lanx sp.*
Bliss Rapids snail	*Taylorconcha serpenticola*
Bruneau Hot springsnail	*Pyrgulopsis bruneauensis*
Snake River Physa snail	*Haitia (Physa) natricina*
Fender's blue butterfly	*Icaricia icarioides fenderi*
Oregon silverspot butterfly	*Speyeria zerene Hippolyta*
Taylor's checkerspot butterfly	*Euphydryas editha taylori*
PLANTS	
Bradshaw's lomatium	*Lomatium bradshawii*
Cook's lomatium	*Lomatium cookii*
Gentner's fritillary	*Fritillaria gentneri*

New Species Consulted Upon

Golden paintbrush	*Castilleja levisecta*
Howell's spectacular thelypody	*Thelypodium howellii spectabilis*
Kincaid's lupine	*Lupinus sulphureus ssp. Kincaidii*
Large-flowered wooly meadowfoam	*Limnanthes floccosa*
Malheur wire-lettuce	*Stephanomeria malheurensis*
McFarlane's four o'clock	*Mirabilis macfarlanei*
Nelson's checkermallow	*Sidalcea nelsoniana*
Rough popcorn flower	*Plagiobothrys hirtus*
Showy stickseed	*Hackelia hispida*
Slickspot peppergrass	*Lepidium papilliferum*
Spalding's catchfly	*Silene spaldingii*
Umtanum Desert buckwheat	*Eriogonum codium*
Ute ladies' tresses	*Spiranthes diluvialis*
Water howellia	*Howellia aquatilis*
Wenatchee Mountain checkermallow	*Sidalcea oregana var. calva*
Western lily	*Lilium occidentale*
Willamette daisy	*Erigeron decumbens*
White Bluffs bladderpod	*Physaria douglasii*

Action Area.

BPA widened the action area for HIP III beyond the Columbia River Basin in Oregon, Washington and Idaho to include western Montana and Oregon coastal river basins from the Columbia River south to Cape Blanco in southwestern Oregon, to reflect anticipated HIPIII expenditures in these geographic areas.



General Aquatic Conservation Measures Applicable to all Actions.

The activities covered under the HIPIII are intended to protect and restore fish and wildlife habitat with long-term benefits to ESA-listed species. However, project construction may have short-term adverse effects on ESA-listed species and associated critical habitat. To minimize these short-term adverse effects and make them predictable for the purposes of programmatic analysis, the BPA will include in all projects implemented under this HIP III proposed action the following general conservation measures (developed in coordination with USFWS and NMFS).

Project Design and Site Preparation.

1) **Climate change.** Best available science regarding the future effects within the project area of climate change, such as changes in stream flows and water temperatures, will be considered during project design.

2) **State and Federal Permits.** All applicable regulatory permits and official project authorizations will be obtained before project implementation. These permits and authorizations include, but are not limited to, National Environmental Policy Act, National Historic Preservation Act, and the appropriate state agency removal and fill permit, USACE Clean Water Act (CWA) 404 permits, and CWA section 401 water quality certifications.

3) **Timing of in-water work.** Appropriate state (Oregon Department of Fish and Wildlife (ODFW), Washington Department of Fish and Wildlife (WDFW), Idaho Department of Fish and Game (IDFG), and Montana Fish Wildlife and Parks (MFWP)) guidelines for timing of in-water work windows (IWW) will be followed.
   a) Bull trout - While utilizing the appropriate State designated in-water work period will lessen the risk to bull trout, this alone may not be sufficient to adequately protect local bull trout populations. This is especially true if work is occurring in spawning and rearing areas because eggs, alevin, and fry are in the substrate or closely associated habitats nearly year round. Some areas may not have designated in-water work windows for bull trout or if they do, they may conflict with work windows for salmon and steelhead. If this is the case, or if proposed work is to occur within bull trout spawning and rearing habitats, project proponents will contact the appropriate USFWS Field Office to insure that all reasonable implementation measures are considered and an appropriate in-water work window is being used to minimize project effects.
   b) Lamprey – the project sponsor and/or their contractors will avoid working in stream or river channels that contain Pacific Lamprey from March 1 to July 1 in low to mid elevation reaches (<5,000 feet). In high elevation reaches (>5,000 feet), the project sponsor will avoid working in stream or river channels from March 1 to August 1. If either timeframe is incompatible with other objectives, the area will be surveyed for nests and lamprey presence, and avoided if possible. If lampreys are known to exist, the project sponsor will utilize dewatering and salvage procedures outlined in US Fish and Wildlife Service (2010)[1].

[1] U.S. Fish and Wildlife Service. 2010. Best management practices to minimize adverse effects to Pacific lamprey. Available online at:

c) Exceptions to ODFW, WDFW, MFWP, or IDFG in-water work windows will be requested through the Variance process (Page 2).

4) **Contaminants.** The project sponsor will complete a site assessment with the following elements to identify the type, quantity, and extent of any potential contamination for any action that involves excavation of more than 20 cubic yards of material:
   a) A review of available records, such as former site use, building plans, and records of any prior contamination events;
   b) A site visit to inspect the areas used for various industrial processes and the condition of the property;
   c) Interviews with knowledgeable people, such as site owners, operators, and occupants, neighbors, or local government officials; and
   d) A summary, stored with the project file that includes an assessment of the likelihood that contaminants are present at the site, based on items 5(a) through 5(c).

5) **Site layout and flagging.** Prior to construction, the action area will be clearly flagged to identify the following:
   a) Sensitive resource areas, such as areas below ordinary high water, spawning areas, springs, and wetlands;
   b) Equipment entry and exit points;
   c) Road and stream crossing alignments;
   d) Staging, storage, and stockpile areas; and
   e) No-spray areas and buffers.

6) **Temporary access roads and paths.**
   a) Existing access roads and paths will be preferentially used whenever reasonable, and the number and length of temporary access roads and paths through riparian areas and floodplains will be minimized to lessen soil disturbance and compaction, and impacts to vegetation.
   b) Temporary access roads and paths will not be built on slopes where grade, soil, or other features suggest a likelihood of excessive erosion or failure. If slopes are steeper than 30%, then the road will be designed by a civil engineer with experience in steep road design.
   c) The removal of riparian vegetation during construction of temporary access roads will be minimized. When temporary vegetation removal is required, vegetation will be cut at ground level (not grubbed).
   d) At project completion, all temporary access roads and paths will be obliterated, and the soil will be stabilized and revegetated. Road and path obliteration refers to the most comprehensive degree of decommissioning and involves decompacting the surface and ditch, pulling the fill material onto the running surface, and reshaping to match the original contour.
   e) Temporary roads and paths in wet areas or areas prone to flooding will be obliterated by the end of the in-water work window.

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http://www.fws.gov/pacific/Fisheries/sphabcon/lamprey/pdf/Best%20Management%20Practices%20for%20Pacific%20Lamprey%20April%202010%20Version.pdf

7) **Temporary stream crossings.**
   a) Existing stream crossings will be preferentially used whenever reasonable, and the number of temporary stream crossings will be minimized.
   b) Temporary bridges and culverts will be installed to allow for equipment and vehicle crossing over perennial streams during construction.
   c) Equipment and vehicles will cross the stream in the wet only where:
      i. The streambed is bedrock; or
      ii. Mats or off-site logs are placed in the stream and used as a crossing.
   d) Vehicles and machinery will cross streams at right angles to the main channel wherever possible.
   e) The location of the temporary crossing will avoid areas that may increase the risk of channel re-routing or avulsion.
   f) Potential spawning habitat (i.e., pool tailouts) and pools will be avoided to the maximum extent possible.
   g) No stream crossings will occur at active spawning sites, when holding adult listed fish are present, or when eggs or alevins are in the gravel. The appropriate state fish and wildlife agency will be contacted for specific timing information.
   h) After project completion, temporary stream crossings will be obliterated and the stream channel and banks restored.

8) **Staging, storage, and stockpile areas.**
   a) Staging areas (used for construction equipment storage, vehicle storage, fueling, servicing, and hazardous material storage) will be 150 feet or more from any natural water body or wetland, or on an adjacent, established road area in a location and manner that will preclude erosion into or contamination of the stream or floodplain.
   b) Natural materials used for implementation of aquatic restoration, such as large wood, gravel, and boulders, may be staged within the 100-year floodplain.
   c) Any large wood, topsoil, and native channel material displaced by construction will be stockpiled for use during site restoration at a specifically identified and flagged area.
   d) Any material not used in restoration, and not native to the floodplain, will be removed to a location outside of the 100-year floodplain for disposal.

9) **Equipment.** Mechanized equipment and vehicles will be selected, operated, and maintained in a manner that minimizes adverse effects on the environment (e.g., minimally-sized, low pressure tires; minimal hard-turn paths for tracked vehicles; temporary mats or plates within wet areas or on sensitive soils). All vehicles and other mechanized equipment will be:
   a) Stored, fueled, and maintained in a vehicle staging area placed 150 feet or more from any natural water body or wetland or on an adjacent, established road area;
   b) Refueled in a vehicle staging area placed 150 feet or more from a natural waterbody or wetland, or in an isolated hard zone, such as a paved parking lot or adjacent, established road (this measure applies only to gas-powered equipment with tanks larger than 5 gallons);
   c) Biodegradable lubricants and fluids shall be used on equipment operating in and adjacent to the stream channel and live water.

d) Inspected daily for fluid leaks before leaving the vehicle staging area for operation within 150 feet of any natural water body or wetland; and
e) Thoroughly cleaned before operation below ordinary high water, and as often as necessary during operation, to remain grease free.

10) **Erosion control.** Erosion control measures will be prepared and carried out, commensurate in scope with the action, that may include the following:
   a) Temporary erosion controls.
      i. Temporary erosion controls will be in place before any significant alteration of the action site and appropriately installed downslope of project activity within the riparian buffer area until site rehabilitation is complete.
      ii. If there is a potential for eroded sediment to enter the stream, sediment barriers will be installed and maintained for the duration of project implementation.
      iii. Temporary erosion control measures may include fiber wattles, silt fences, jute matting, wood fiber mulch and soil binder, or geotextiles and geosynthetic fabric.
      iv. Soil stabilization utilizing wood fiber mulch and tackifier (hydro-applied) may be used to reduce erosion of bare soil if the materials are noxious weed free and nontoxic to aquatic and terrestrial animals, soil microorganisms, and vegetation.
      v. Sediment will be removed from erosion controls once it has reached 1/3 of the exposed height of the control.
      vi. Once the site is stabilized after construction, temporary erosion control measures will be removed.
   b) Emergency erosion controls. The following materials for emergency erosion control will be available at the work site:
      i. A supply of sediment control materials; and
      ii. An oil-absorbing floating boom whenever surface water is present.

11) **Dust abatement.** The project sponsor will determine the appropriate dust control measures by considering soil type, equipment usage, prevailing wind direction, and the effects caused by other erosion and sediment control measures. In addition, the following criteria will be followed:
   a) Work will be sequenced and scheduled to reduce exposed bare soil subject to wind erosion.
   b) Dust-abatement additives and stabilization chemicals (typically magnesium chloride, calcium chloride salts, or ligninsulfonate) will not be applied within 25 feet of water or a stream channel and will be applied so as to minimize the likelihood that they will enter streams. Applications of ligninsulfonate will be limited to a maximum rate of 0.5 gallons per square yard of road surface, assuming a 50:50 (ligninsulfonate to water) solution.
   c) Application of dust abatement chemicals will be avoided during or just before wet weather, and at stream crossings or other areas that could result in unfiltered delivery of the dust abatement materials to a waterbody (typically these would be areas within 25 feet of a waterbody or stream channel; distances may be greater where vegetation is sparse or slopes are steep).
   d) Spill containment equipment will be available during application of dust abatement chemicals.
   e) Petroleum-based products will not be used for dust abatement.

13) **Spill prevention, control, and counter measures.** The use of mechanized machinery increases the risk for accidental spills of fuel, lubricants, hydraulic fluid, or other contaminants into the riparian zone or directly into the water. Additionally, uncured concrete and form materials adjacent to the active stream channel may result in accidental discharge into the water. These contaminants can degrade habitat, and injure or kill aquatic food organisms and ESA-listed species. The project sponsor will adhere to the following measures:
    a) A description of hazardous materials that will be used, including inventory, storage, and handling procedures will be available on-site.
    b) Written procedures for notifying environmental response agencies will be posted at the work site.
    c) Spill containment kits (including instructions for cleanup and disposal) adequate for the types and quantity of hazardous materials used at the site will be available at the work site.
    d) Workers will be trained in spill containment procedures and will be informed of the location of spill containment kits.
    e) Any waste liquids generated at the staging areas will be temporarily stored under an impervious cover, such as a tarpaulin, until they can be properly transported to and disposed of at a facility that is approved for receipt of hazardous materials.

14) **Invasive species control.** The following measures will be followed to avoid introduction of invasive plants and noxious weeds into project areas:
    a) Prior to entering the site, all vehicles and equipment will be power washed, allowed to fully dry, and inspected to make sure no plants, soil, or other organic material adheres to the surface.
    b) Watercraft, waders, boots, and any other gear to be used in or near water will be inspected for aquatic invasive species.
    c) Wading boots with felt soles are not to be used due to their propensity for aiding in the transfer of invasive species.

Work Area Isolation & Fish Salvage.

Any work area within the wetted channel will be isolated from the active stream whenever ESA-listed fish are reasonably certain to be present, or if the work area is less than 300-feet upstream from known spawning habitats. When work area isolation is required, design plans will include all isolation elements, fish release areas, and, when a pump is used to dewater the isolation area and fish are present, a fish screen that meets NMFS's fish screen criteria (NMFS 2011[2], or most current). Work area isolation and fish capture activities will occur during periods of the coolest air and water temperatures possible, normally early in the morning versus late in the day, and during conditions appropriate to minimize stress and death of species present.

For salvage operations in known bull trout spawning and rearing habitat, electrofishing shall only occur from May 1 to July 31. No electrofishing will occur in any bull trout occupied habitat after August 15. Bull trout are very temperature sensitive and generally should not be electroshocked or otherwise handled when temperatures exceed 15 degrees celsius. Salvage activities should take place during periods of the coolest air and water temperatures possible, normally early in the morning versus late in the day, and during conditions appropriate to minimize stress to fish species present.

Salvage operations will follow the ordering, methodologies, and conservation measures specified below in Steps 1 through 6. Steps 1 and 2 will be implemented for all projects where work area isolation is necessary according to conditions above. Electrofishing (Step 3) can be implemented to ensure all fish have been removed following Steps 1 and 2, or when other means of fish capture may not be feasible or effective. Dewatering and rewatering (Steps 4 and 5) will be implemented unless wetted in-stream work is deemed to be minimally harmful to fish, and is beneficial to other aquatic species. Dewatering will not be conducted in areas known to be occupied by lamprey, unless lampreys are salvaged using guidance set forth in US Fish and Wildlife Service (2010)[3].

1) **Isolate.**
   a) Block nets will be installed at upstream and downstream locations and maintained in a secured position to exclude fish from entering the project area.
   b) Block nets will be secured to the stream channel bed and banks until fish capture and transport activities are complete. Block nets may be left in place for the duration of the project to exclude fish.
   c) If block nets remain in place more than one day, the nets will be monitored at least daily to ensure they are secured to the banks and free of organic accumulation. If the project is within bull trout spawning and rearing habitat, the block nets must be checked every four

[2] National Marine Fisheries Service. 2011. Anadromous salmonid passage facility design. Northwest Region. Available online at: http://www.nwr.noaa.gov/Salmon-Hydropower/FERC/upload/Fish-Passage-Design.pdf

[3] U.S. Fish and Wildlife Service. 2010. Best management practices to minimize adverse effects to Pacific lamprey. Available online at: http://www.fws.gov/pacific/Fisheries/sphabcon/lamprey/pdf/Best%20Management%20Practices%20for%20Pacific%20Lamprey%20April%202010%20Version.pdf

hours for fish impingement on the net. Less frequent intervals must be approved through a variance request.

d) Nets will be monitored hourly anytime there is instream disturbance.

2) **Salvage.** – As described below, fish trapped within the isolated work area will be captured to minimize the risk of injury, then released at a safe site:
   a) Remove as many fish as possible prior to dewatering.
   b) During dewatering, any remaining fish will be collected by hand or dip nets.
   c) Seines with a mesh size to ensure capture of the residing ESA-listed fish will be used.
   d) Minnow traps will be left in place overnight and used in conjunction with seining.
   e) If buckets are used to transport fish:
      i. The time fish are in a transport bucket will be limited, and will be released as quickly as possible;
      ii. The number of fish within a bucket will be limited based on size, and fish will be of relatively comparable size to minimize predation;
      iii. Aerators for buckets will be used or the bucket water will be frequently changed with cold clear water at 15 minute or more frequent intervals.
      iv. Buckets will be kept in shaded areas or will be covered by a canopy in exposed areas.
      v. Dead fish will not be stored in transport buckets, but will be left on the stream bank to avoid mortality counting errors.
   f) As rapidly as possible (especially for temperature-sensitive bull trout), fish will be released in an area that provides adequate cover and flow refuge. Upstream release is generally preferred, but fish released downstream will be sufficiently outside of the influence of construction.
   g) Salvage will be supervised by a qualified fisheries biologist experienced with work area isolation and competent to ensure the safe handling of all fish.

3) **Electrofishing.** Electrofishing will be used only after other salvage methods have been employed or when other means of fish capture are determined to not be feasible or effective. If electrofishing will be used to capture fish for salvage, the salvage operation will be led by an experienced fisheries biologist and the following guidelines will be followed:
   a) The NMFS's electrofishing guidelines (NMFS 2000).
   b) Only direct current (DC) or pulsed direct current (PDC) will be used and conductivity must be tested.
      i. If conductivity is less than 100 µs, voltage ranges from 900 to 1100 will be used.
      ii. For conductivity ranges between 100 to 300 µs, voltage ranges will be 500 to 800.
      iii. For conductivity greater than 300 µs, voltage will be less than 400.
   c) Electrofishing will begin with a minimum pulse width and recommended voltage and then gradually increase to the point where fish are immobilized.
   d) The anode will not intentionally contact fish.
   e) Electrofishing shall not be conducted when the water conditions are turbid and visibility is poor. This condition may be experienced when the sampler cannot see the stream bottom in one foot of water.
   f) If mortality or obvious injury (defined as dark bands on the body, spinal deformations, de-scaling of 25% or more of body, and torpidity or inability to maintain upright attitude after sufficient recovery time) occurs during electrofishing, operations will be

immediately discontinued, machine settings, water temperature and conductivity checked, and procedures adjusted or electrofishing postponed to reduce mortality.

4) **Dewater.** Dewatering, when necessary, will be conducted over a sufficient period of time to allow species to naturally migrate out of the work area and will be limited to the shortest linear extent practicable.
   a) Diversion around the construction site may be accomplished with a coffer dam and a by-pass culvert or pipe, or a lined, non-erodible diversion ditch. Where gravity feed is not possible, a pump may be used, but must be operated in such a way as to avoid repetitive dewatering and rewatering of the site. Impoundment behind the cofferdam must occur slowly through the transition, while constant flow is delivered to the downstream reaches.
   b) All pumps will have fish screens to avoid juvenile fish impingement or entrainment, and will be operated in accordance with NMFS's current fish screen criteria (NMFS 2011[4], or most recent version). If the pumping rate exceeds 3 cubic feet second (cfs), a NMFS Hydro fish passage review will be necessary.
   c) Dissipation of flow energy at the bypass outflow will be provided to prevent damage to riparian vegetation or stream channel.
   d) Safe reentry of fish into the stream channel will be provided, preferably into pool habitat with cover, if the diversion allows for downstream fish passage.
   e) Seepage water will be pumped to a temporary storage and treatment site or into upland areas to allow water to percolate through soil or to filter through vegetation prior to reentering the stream channel.

5) **Re-watering.** Upon project completion, the construction site will be slowly re-watered to prevent loss of surface flow downstream and to prevent a sudden increase in stream turbidity. During re-watering, the site will be monitored to prevent stranding of aquatic organisms below the construction site.

6) **Salvage Notice.** Monitoring and recording of fish presence, handling, and mortality must occur during the duration of the isolation, salvage, electrofishing, dewatering, and rewatering operations. Once operations are completed, a salvage report will document procedures used, any fish injuries or deaths (including numbers of fish affected), and causes of any deaths.

[4] National Marine Fisheries Service. 2011. Anadromous salmonid passage facility design. Northwest Region. Available online at: http://www.nwr.noaa.gov/Salmon-Hydropower/FERC/upload/Fish-Passage-Design.pdf

Construction and Post-Construction Conservation Measures.

1) **Fish passage.** Fish passage will be provided for any adult or juvenile fish likely to be present in the action area during construction, unless passage did not exist before construction or the stream is naturally impassable at the time of construction. If the provision of temporary fish passage during construction will increase negative effects on aquatic species of interest or their habitat, a variance can be requested from the NMFS Branch Chief and the FWS Field Office Supervisor (Appendix B of this BO). Pertinent information, such as the species affected, length of stream reach affected, proposed time for the passage barrier, and alternatives considered, will be included in the variance request.

2) **Construction and discharge water.**
   a) Surface water may be diverted to meet construction needs, but only if developed sources are unavailable or inadequate.
   b) Diversions will not exceed 10% of the available flow.
   c) All construction discharge water will be collected and treated using the best available technology applicable to site conditions.
   d) Treatments to remove debris, nutrients, sediment, petroleum hydrocarbons, metals and other pollutants likely to be present will be provided.

3) **Minimize time and extent of disturbance.** Earthwork (including drilling, excavation, dredging, filling and compacting) in which mechanized equipment is in stream channels, riparian areas, and wetlands will be completed as quickly as possible. Mechanized equipment will be used in streams only when project specialists believe that such actions are the only reasonable alternative for implementation, or would result in less sediment in the stream channel or damage (short- or long-term) to the overall aquatic and riparian ecosystem relative to other alternatives. To the extent feasible, mechanized equipment will work from the top of the bank, unless work from another location would result in less habitat disturbance.

4) **Cessation of work.** Project operations will cease under the following conditions:
   a) High flow conditions that may result in inundation of the project area, except for efforts to avoid or minimize resource damage;
   b) When allowable water quality impacts, as defined by the state CWA section 401 water quality certification or HIPIII Turbidity Monitoring Protocol, have been exceeded; or
   c) When "incidental take" limitations have been reached or exceeded.

5) **Site restoration.** When construction is complete:
   a) All streambanks, soils, and vegetation will be cleaned up and restored as necessary using stockpiled large wood, topsoil, and native channel material.
   b) All project related waste will be removed.
   c) All temporary access roads, crossings, and staging areas will be obliterated. When necessary for revegetation and infiltration of water, compacted areas of soil will be loosened.
   d) All disturbed areas will be rehabilitated in a manner that results in similar or improved conditions relative to pre-project conditions. This will be achieved through redistribution of stockpiled materials, seeding, and/or planting with local native seed mixes or plants.

6) **Revegetation.** Long-term soil stabilization of disturbed sites will be accomplished with reestablishment of native vegetation using the following criteria:
   a) Planting and seeding will occur prior to or at the beginning of the first growing season after construction.
   b) An appropriate mix of species that will achieve establishment, shade, and erosion control objectives, preferably forb, grass, shrub, or tree species native to the project area or region and appropriate to the site will be used.
   c) Vegetation, such as willow, sedge and rush mats, will be salvaged from disturbed or abandoned floodplains, stream channels, or wetlands.
   d) Invasive species will not be used.
   e) Short-term stabilization measures may include the use of non-native sterile seed mix (when native seeds are not available), weed-free certified straw, jute matting, and other similar techniques.
   f) Surface fertilizer will not be applied within 50 feet of any stream channel, waterbody, or wetland.
   g) Fencing will be installed as necessary to prevent access to revegetated sites by livestock or unauthorized persons.
   h) Re-establishment of vegetation in disturbed areas will achieve at least 70% of pre-project conditions within 3 years.
   i) Invasive plants will be removed or controlled until native plant species are well-established (typically 3 years post-construction).

7) **Site access.** The project sponsor will retain the right of reasonable access to the site in order to monitor the success of the project over its life.

8) **Implementation monitoring.** Project sponsor staff or their designated representative will provide implementation monitoring to ensure compliance with the applicable biological opinion, including:
   a) General conservation measures are adequately followed; and
   b) Effects to listed species are not greater than predicted and incidental take limitations are not exceeded.

9) **CWA section 401 water quality certification.** The project sponsor or designated representative will complete and record water quality observations to ensure that in-water work is not degrading water quality. During construction, CWA section 401 water quality certification provisions provided by the Oregon Department of Environmental Quality, Washington Department of Ecology, or Idaho Department of Environmental Quality will be followed.

10) **Turbidity Monitoring Protocol.** Turbidity monitoring shall be conducted in accordance with the HIPIII turbidity monitoring protocol outlined on the following page and recorded in the Project Completion Form (PCF).

HIPIII Turbidity Monitoring Protocol.

The Project Sponsor shall complete and record the following water quality observations to ensure that any increase in suspended sediment is not exceeding the limit for HIPIII compliance. Records shall be reported on the HIPIII Project Completion Form (PCF).

If the geomorphology of the project area (silty or claylike materials) or the nature of the action (large amounts of bare earth exposed below the waterline) shall preclude the successful compliance with these triggers, notify your EC_Lead who shall inform the Services of a likely exceedance.

1. Take a background turbidity sample using an appropriately and frequently calibrated turbidimeter in accord with manufacturer's instructions, or a visual turbidity observation, every 2 hours while work is being implemented, or more often if turbidity disturbances vary greatly, to ensure that the in-water work area is not contributing visible sediment to the water column. The background samples or observations should be taken at a relatively undisturbed area approximately 100 feet upstream from the project area. Record the observation, location, and time before monitoring at the downstream point.

2. Take a second sample or observation, immediately after each upstream sample or observation, approximately 50 feet downstream from the project area in streams that are 30 feet wide or less; 100 feet downstream from the project area for streams between 30 and 100 feet wide; 200 feet downstream from the project area for streams greater than 100 feet wide; and 300 feet from the discharge point or nonpoint source for areas subject to tidal or coastal scour. Record the downstream observation, location, and time.

3. Compare the upstream and downstream observations/samples. If observed or measured turbidity downstream is more than upstream observation or measurement (> 10%), the activity must be modified to reduce turbidity. If visual estimates are used, an obvious difference between upstream and downstream observations shall bear the assumption of a (> 10%) difference. Continue to monitor every 2 hours as long as instream activity continues.

4. If exceedances occur for more than two monitoring intervals in a row (after 4 hours), the activity must stop until the turbidity level returns to background, and the EC lead must be notified within 48 hours. The EC lead shall document the reasons for the exceedance, corrective measures taken, notify the local NMFS branch chief and/or USFWS field supervisor and seek recommendations.

5. If at any time, monitoring, inspections, or observations/samples show that the turbidity controls are ineffective, immediately mobilize work crews to repair, replace, or reinforce controls as necessary.

Fish Passage Restoration (Profile Discontinuities).

The BPA proposes to review and fund fish passage projects for ESA-listed salmon, steehead and bull trout (hereafter salmonids). The objective of fish passage restoration is to allow all life stages of salmonids access to historical habitat from which they have been excluded and focuses on restoring safe upstream and downstream fish passage to stream reaches that have become isolated by obstructions, non-functioning structures, or instream profile discontinuities resulting from insufficient depth, or excessive jump heights and velocities.

Although passage actions are generally viewed as positive actions for native fish restoration, there may be occasions where restoring passage exposes native fish (isolated above or below a barrier) to negative influences (predation, competition, hybridization) from non-native species such as brook trout, brown trout and lake trout. Proposed passage projects that may increase bull trout to non-native species must be approved by the appropriate FWS Field Office Supervisor.

BPA grouped passage projects according the effects and review requirements in the following subcategories: **Profile Discontinuities** and **Transportation Infrastructure**. These subcategories represent a logical break between transportation related effects (transportation infrastructure) and effects due to physical fish barriers, classified by water velocity, water depth, and barrier height (profile discontinuities).

The BPA proposes the following activities to improve fish passage; (a) Dams, Water Control or Legacy Structure Removal; (b) Consolidate, or Replace Existing Irrigation Diversions; (c) Headcut and Grade Stabilization; (d) Low Flow Consolidation; and (e) Providing Fish passage at an existing facility.

1a) Dams, Water Control Structures, or Legacy Structures Removal.

Description. BPA proposes to fund and review fish passage projects, and restore more natural channel and flow conditions by removing small dams, channel-spanning weirs, earthen embankments, subsurface drainage features, spillway systems, tide gates, outfalls, pipes, instream flow redirection structures (*e.g.*, drop structure, gabion, groin), or similar devices used to control, discharge, or maintain water levels.

Small dams include instream structures that are 10 feet in height or less for streams with an active channel width of less than 50-feet and a slope less than 4%, or up to 16.4 feet in height and a slope greater than 4%.

If the structure being removed contains material (i.e. large wood, boulders, etc) that is typically found within the stream or floodplain at that site, the material can be reused to implement habitat improvements. Any such project must follow the design criteria outlined in the **Install Habitat-Forming Natural Material Instream Structures (Large Wood, Boulders, and Spawning Gravel)** activity category (Page 41).

Guidelines for Review.

Low Risk: Removal of subsurface drainage features, tide gates, outfalls, pipes, small dams with total head measurement equal to or less than 3 feet, instream flow redirection structures that meet all conservation measures.

Medium Risk: Removal of channel spanning weirs, earthen embankments and spillway systems. Removal of dams, water-control, or legacy structures< 3 feet that do not meet all conservation measures will require both RRT and NMFS Hydro Review.

High Risk: Removal of small dams > 3 feet and <10 feet high in height for streams with active channel width of < 50 feet and a slope <4%, or >3 feet and < 16.4 feet in height with a slope greater than 4% will require both RRT and NMFS Hydro Review.

Prior to going to the RRT, Medium or High Risk projects shall address the **General Project and Data Summary Requirements** (Page 50) in addition to the following:

1) A longitudinal profile of the stream channel thalweg for 20 channel widths upstream and downstream of the structure shall be used to determine the potential for channel degradation.

2) A minimum of three cross-sections – one downstream of the structure, one through the reservoir area upstream of the structure, and one upstream of the reservoir area outside of the influence of the structure) to characterize the channel morphology and quantify the stored sediment.

3) Sediment characterization to determine the proportion of coarse sediment (>2mm) in the reservoir area.

4) A survey of any downstream spawning areas that may be affected by sediment released by removal of the water control structure or dam. Reservoirs with a d35 greater than 2 mm (i.e., 65% of the sediment by weight exceeds 2 mm in diameter) may be removed without excavation of stored material, if the sediment contains no contaminants; reservoirs with a d35 less than 2 mm (i.e., 65% of the sediment by weight is less than 2 mm in diameter) will require partial removal of the fine sediment to create a pilot channel, in conjunction with stabilization of the newly exposed streambanks with native vegetation.

Conservation Measures.

1) Restore all structure banklines and fill in holes with native materials to restore contours of stream bank and floodplain. Compact the fill material adequately to prevent washing out of the soil during over bank flooding. Do not mine material from the stream channel to fill in "key" holes. When removal of buried (keyed) structures could result in significant disruption to riparian vegetation and/or the floodplain, consider leaving the buried structure sections within the streambank.

2) If the legacy structures (log, rock, or gabion weirs) were placed to provide grade control, evaluate the site for potential headcutting and incision due to structure removal by using the appropriate guidance.[5] If headcutting and channel incision are likely to occur due to structure removal, additional measures must be taken to reduce these impacts (see grade control options described under **Headcut and Grade Stabilization** activity category (Page 23)).

3) If the structure is being removed because it has caused an over-widening of the channel, consider implementing other HIP III restoration categories to decrease the width to depth ratio of the stream at that location to a level commensurate with representative upstream and downstream sections (within the same channel type).

4) Tide gates can only be removed not modified or replaced. Modification or replacement of tidegates are not covered under the HIPIII.

[5] Castro, J. 2003. Geomorphologic Impacts of Culvert Replacement and Removal: Avoiding Channel Incision. Oregon Fish and Wildlife Office, Portland, OR. Available at: http://library.fws.gov/pubs1/culvert-guidelines03.pdf

1b) Consolidate, or Replace Existing Irrigation Diversions.

Description. The BPA proposes to fund and review the consolidation or replacement of existing diversions with pump stations or engineered riffles (including cross vanes, "W" weirs, or "A" frame weirs) to reduce the number of diversions on streams and thereby conserve water and improve habitat for fish, improve the design of diversions to allow for fish passage and adequate screening, or reduce the annual instream construction of push-up dams and instream structures. Small instream rock structures that facilitate proper pump station operations are allowed when designed in association with the pump station.. Periodic maintenance of irrigation diversions will be conducted to ensure their proper functioning, *i.e*., cleaning debris buildup, and replacement of parts. If low flow conditions coupled with diversion withdrawals result in impassable conditions for fish, then irrigation system efficiencies will be implemented with water savings committed to improve reach passage conditions.

The BPA HIP III will only cover irrigation efficiency actions within this activity category that use state approved regulatory mechanisms (e.g. Oregon ORS 537.455-.500, Washington RCW 90.42) for ensuring that water savings will be protected as instream water rights, or in cases where project implementers identify how the water conserved will remain instream to benefit fish without any significant loss of the instream flows to downstream diversions.

Unneeded or abandoned irrigation diversion structures will be removed where they are barriers to fish passage, have created wide shallow channels or simplified habitat, or are causing sediment concerns through deposition behind the structure or downstream scour according to **Dams, Water Control Structures, or Legacy Structures Removal** section.

Infiltration galleries and lay-flat stanchions are not covered under HIPIII.

Guidelines for Review.

Low Risk: Removal or replacement of Irrigation diversion structures less than 3 feet in height that meet all conservation measures.

Medium Risk: Removal or replacement of irrigation diversion structures greater than 3 feet in height and/or any irrigation project that does not meet all of the conservation measures will require both RRT and NMFS Hydro Review.

Prior to going to the RRT, medium to high risk projects shall address the **General Project and Data Summary Requirements** (Page 50) in addition to the following:

1) A longitudinal profile of the stream channel thalweg for 20 channel widths upstream and downstream of the structure shall be used to determine the potential for channel degradation.

2) A minimum of three cross-sections – one downstream of the structure, one through the reservoir area upstream of the structure, and one upstream of the reservoir area outside of the influence of the structure) to characterize the channel morphology and quantify the stored sediment.

Conservation Measures

1) Diversion structures shall be designed to meet NMFS Anadromous Salmonid Passage Facility Design Guidelines (NMFS 2011 or more recent version)[6].

2) Placement of rock structures or engineered riffles shall follow criteria outlined in the **Headcut and Grade Stabilization** activity category (Page 23).

3) Project design shall include the installation of a totalizing flow meter device on all diversions for which installation of this device is possible. A staff gauge or other device capable of measuring instantaneous flow will be utilized on all other diversions.

4) Multiple existing diversions may be consolidated into one diversion if the consolidated diversion is located at the most downstream existing diversion point unless sufficient low flow conditions are available to support unimpeded passage. The design will clearly identify the low flow conditions within the stream reach relative to the cumulative diverted water right. If instream flow conditions are proven favorable for fish passage and habitat use then diversion consolidation may occur at the upstream structure.

5) Diversions will be designed to incorporate Point of Diversion (POD) flow restrictions to limit the diverted flow to satisfy the irrigator's water right at the 95% exceedance flow stage. Diversion flow restriction may be accomplished by any practical means available but must be supported by hydraulic calculations and a stage rating curve. POD flow restriction may be accomplished by:
   1) Incorporation of a restricted orifice plate or screen at the POD that provides at a maximum, the required area to pass the irrigators water right.
   2) Mechanically restricting the opening of a variable head gate to the maximum area required to pass the irrigator's water right.
   3) Any other method that will satisfy the intent of the diversion flow governance requirement that can be justified by the design documents.

[6] NMFS (National Marine Fisheries Service). 2011. Anadromous Salmonid Passage Facility Design. NMFS, Northwest Region, Portland, Oregon. Available at: http://www.nwr.noaa.gov/Publications/Reference-Documents/Passage-Refs.cfm

1c) Headcut and Grade Stabilization.

Description. BPA proposes to fund and review the restoration of fish passage and grade control (i.e. headcut stabilization) with geomorphically appropriate structures constructed from rock or large wood (LW). Boulder weirs and roughened channels may be installed for grade control at culverts to mitigate headcuts, and to provide passage at small dams or other channel obstructions that cannot otherwise be removed. For wood dominated systems, grade control engineered log jams (ELJ)'s should be considered as an alternative.

Grade control ELJs are designed to arrest channel downcutting or incision and retain sediment, lower stream energy, and increase water elevations to reconnect floodplain habitat and diffuse downstream flood peaks. Grade control ELJs also serve to protect infrastructure that is exposed by channel incision and to stabilize over-steepened banks. Unlike hard weirs or rock grade control structures, a grade control ELJ is a complex broadcrested structure that dissipates energy more gradually.

If geomorphic conditions are appropriate, consideration should be given towards use of a roughened channel or constructed riffle to minimize the potential for future development of passage (jump height) barrier.

Construction of passage structures is limited to facilitate passage at existing diversion dams of less than seven feet in height, not in combination with new dams.

Guidelines for Review.

Low Risk: Boulder weirs and other grade control structures that are less than 18 inches in height.

***Medium Risk*:** Boulder weirs and other grade control structures that are above 18 inches in height will require both RRT and NMFS Hydro Review. Roughened channels or constructed riffles are considered medium risk.

Prior to going to the RRT, medium to high risk projects shall address the **General Project and Data Summary Requirements** (Page 50) in addition to the following:

1) A longitudinal profile of the stream channel thalweg for 20 channel widths upstream and downstream of the structure shall be used to determine the potential for channel degradation.

2) A minimum of three cross-sections – one downstream of the structure, one through the reservoir area upstream of the structure, and one upstream of the reservoir area outside of the influence of the structure) to characterize the channel morphology and quantify the stored sediment.

Conservation Measures.

1) All structures will be designed to the design benchmarks set forth in (NMFS 2011 or most recent version).

2) Boulder weirs shall incorporate the following design features:
   a) Install boulder weirs low in relation to channel dimensions so that they are completely overtopped during channel-forming flow events (approximately a 1.5-year flow event).
   b) Boulder weirs are to be placed diagonally across the channel or in upstream pointing "V" or "U" configurations with the apex oriented upstream. The apex should be lower than the structure wings to support low flow consolidation.
   c) Boulder weirs are to be constructed to allow upstream and downstream passage of all native fish species and life stages that occur in the stream. This can be accomplished by providing plunges no greater than 6" in height, allowing for juvenile fish passage at all flows.
   d) Key weirs into the stream bed to minimize structure undermining due to scour, preferably at least 2.5x their exposure height. The weir should also be keyed into both banks, if feasible greater than 8 feet.
   e) Include fine material in the weir material mix to help seal the weir/channel bed, thereby preventing subsurface flow. Geotextile material can be used as an alternative approach to prevent subsurface flow.
   f) Rock for boulder weirs shall be durable and of suitable quality to assure permanence in the climate in which it is to be used.
   g) Full spanning boulder weir placement shall be coupled with measures to improve habitat complexity (LW placement etc.) and protection of riparian areas.
   h) The use of gabions, cable or other means to prevent the movement of individual boulders in a boulder weir is not allowed.

i) Headcut stabilization shall incorporate the following design features:
   a) Armor head-cut with sufficiently sized and amounts of material to prevent continued up-stream movement. Materials can include both rock and organic materials which are native to the area.
   b) Focus stabilization efforts in the plunge pool, the head cut, as well as a short distance of stream above the headcut.
   c) Minimize lateral migration of channel around head cut ("flanking") by placing rocks and organic material at a lower elevation in the center of the channel cross section to direct flows to the middle of channel.
   d) Provide fish passage over a stabilized head-cut through a series of log or rock weir structures or a roughened channel.
   e) Headcut stabilization structure will be constructed utilizing streambed simulation bed material, which will be pressure washed into place until there is apparent surface flow and minimal subsurface material to ensure fish passage immediately following construction if natural flows are sufficient. Successful washing will be determined by minimization of voids within placed matrix such that ponding occurs with little to no percolation losses.

1d) Low Flow Consolidation.

Description: BPA proposes to fund and review projects that; (a) modify diffused or braided flow conditions that impede fish passage; (b) modify dam aprons with shallow depth (less than 10 inches), or (c) utilize temporary placement of sandbags, hay bales, and ecology blocks to provide depths and velocities passable to upstream migrants.

Land use practices such as large scale agriculture, including irrigation, and urban and residential development have drastically changed the hydrology of affected watersheds. Reduced forest cover and increased impervious surface have resulted in increased runoff and peak flows and in less aquifer recharge, resulting in increased frequency, duration and magnitude of summer droughts. During recent droughts, temporary placement of sandbags, hay bales, and ecology blocks have been successful in providing short term fish passage through low flow consolidation measures.

Guidelines for Review.

***Medium or High Risk*:** All of the sub-activities under the Low Flow Consolidation activity category will require both RRT and NMFS Hydro Review.

Conservation Measures.

1) Fish Passage will be designed to the design benchmarks set forth in (NMFS 2011 or most recent version)[7]. This shall be verified during NMFS Hydro Review.

2) All temporary material placed in the stream to aid low flow fish passage will be removed when stream flows increase, prior to anticipated high flows that could wash consolidation measures away or cause flow to go around them.

[7] NMFS (National Marine Fisheries Service). 2011. Anadromous Salmonid Passage Facility Design. NMFS, Northwest Region, Portland, Oregon. Available at: http://www.nwr.noaa.gov/Publications/Reference-Documents/Passage-Refs.cfm

1e) Provide Fish Passage at an Existing Facility.

Description: BPA proposes to fund and review projects that; (a) re-engineer fish passage or fish collection facilities that are improperly designed; (b) periodic maintenance of fish passage or fish collection facilities to ensure proper functioning, *e.g*., cleaning debris buildup, replacement of parts; and (c) installation of a fish ladder at an existing facility.

Guidelines for Review.

Low Risk: Periodic Maintenance of Fish passage or Fish Collection Facilities.

Medium or High Risk: Re-engineering improperly designed fish passage or fish collection facilities, installation of a fish ladder at an existing facility, or other activities that are not upkeep or maintenance. Requires both RRT and NMFS Hydro Review.

Conservation Measures.

1) Fish Passage will be designed to the design benchmarks set forth in (NMFS 2011 or most recent version)[8].

2) Design consideration should be given for Pacific Lamprey passage[9]. Fish ladders that are primarily designed for salmonids are usually impediments to lamprey passage as they do not have adequate surfaces for attachment, velocities are often too high and there are inadequate places for resting. Providing for rounded corners, resting areas or providing a natural stream channel (stream simulation) or wetted ramp for passage over the impediment have been effective in facilitating lamprey passage.

[9] 2010 (USFWS) Best Management Practices to Minimize Adverse Effects to Pacific Lamprey. http://www.fws.gov/pacific/Fisheries/sphabcon/lamprey/pdf/Best%20Management%20Practices%20for%20Pacific%20Lamprey%20April%202010%20Version.pdf

Fish Passage Restoration (Transportation Infrastructure).

The BPA proposes to review and fund maintenance, removal, or replacement of bridges, culverts and fords to improve fish passage, prevent streambank and roadbed erosion, facilitate natural sediment and wood movement, and eliminate or reduce excess sediment loading.
The BPA proposes the following activities to improve fish passage: (a) Bridge and Culvert Removal or Replacement; (b) Bridge and Culvert Maintenance; and (c) Installation of Fords.

1f) Bridge and Culvert Removal or Replacement.

Description. For unimpaired fish passage it is desirable to have a crossing that is a larger than the channel bankfull width, allows for a functional floodplain, allows for a natural variation in bed elevation, and provides bed and bank roughness similar to the upstream and downstream channel. In general, bridges will be implemented over culverts because they typically do not constrict a stream channel to as great a degree as culverts and usually allow for vertical movement of the streambed (see #3 below). Bottomless culverts may provide a good alternative for fish passage where foundation conditions allow their construction and width criteria can be met.

Guidelines for Review.

***Low Risk*:** Culverts and bridges that meet all conservation measures.

***Medium Risk*:** Culverts and bridges that do not meet all conservation measures or that require grade control greater than 18inches will require RRT Review.

Prior to going to the RRT, medium to high risk projects shall address the **General Project and Data Summary Requirements** (Page 50) in addition to the following:

1) Designs shall include site sketches, drawings, aerial photographs, or other supporting specifications, calculations, or information that is commensurate with the scope of the action, that show the active channel, the 100-year floodplain, the functional floodplain, any artificial fill within the project area, the existing crossing to be replaced, and the proposed crossing.

2) Designs must demonstrate that the crossings: (a) avoid causing local scour of streambanks and reasonably likely spawning areas; (b) allow the fluvial transport of large wood, up to a site potential tree height in size, through the project area without becoming stranded on the bridge structure; (c) allow for likely channel migration patterns within the functional floodplain for the design life of the bridge; and otherwise align with well-defined, stable channels; and (d) allow for the passage of all aquatic organisms.

3) Fish Passage will be designed to the design benchmarks set forth in (NMFS 2011 or most recent version)[10].

Conservation measures.

1) A crossing (utilizing an open bottom technique) shall:
    a) Maintain the general scour prism, as a clear, unobstructed opening (i.e., free of any fill, embankment, scour countermeasure, or structural material).
    b) Be a single span structure that maintains a clear, unobstructed opening above the general scour elevation (100-year floodplain) that is at least as wide as 1.5 times the bankfull width (Figure 1).
    c) Be a multiple span structure that maintains a clear, unobstructed opening above the general scour elevation, except for piers or interior bents, that is at least as wide as 2.2 times the bankfull width.

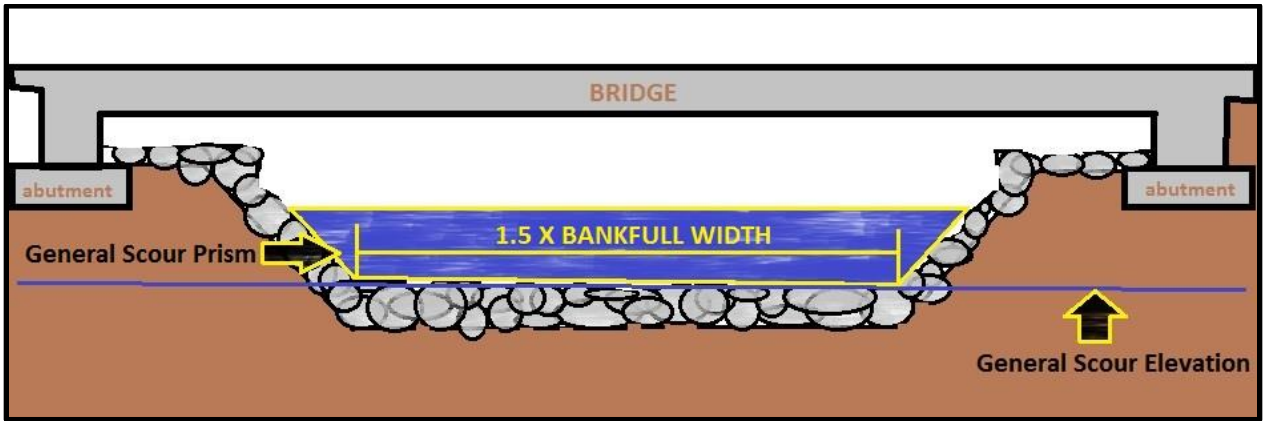

Figure 1: Bridge Scour Prism Illustration.

2) Bridge scour and stream stability countermeasures may be applied below the general scour elevation, however, except as described above in (1c), no scour countermeasure may be applied above the general scour elevation.

3) Remove all other artificial constrictions within the functional floodplain of the project area as follows:
    a) Remove existing roadway fill, embankment fill, approach fill, or other fills.
    b) Install relief conduits through existing fill.
    c) Remove vacant bridge supports below total scour depth, unless the vacant support is part of the rehabilitated or replacement stream crossing.
    d) Reshape exposed floodplains and streambanks to match upstream and downstream conditions.

4) If the crossing will occur within 300 feet of active spawning area, only full span bridges or streambed simulation will be used.

5) Projects in stream channels with gradients above six percent will utilize a bridge or if a bridge is determined to not be feasible, then crossing will be designed using the stream simulation option.

6) Maximum culvert width shall be 20 feet, for widths greater than 20 feet a bridge will be used.

7) Culvert length shall not be longer than:
    a) 150 feet for stream simulation
    b) 75 feet for no-slope and
    c) 500 feet for any other option.

8) The proponent shall include suitable grade controls to prevent culvert failure caused by changes in stream elevation. Grade control structures to prevent headcutting above or below the culvert or bridge may be built using rock or wood as outlined in the **Headcut and Grade Stabilization** criteria under the **Profile Discontinuity** activity subcategory (Page 23).

1g) Bridge and Culvert Maintenance.

Guidelines for Review.

Low Risk: *Culverts and bridge maintenance is a low risk activity and requires no review.*

Conservation measures:

1) Culverts will be cleaned by working from the top of the bank, unless culvert access using work area isolation would result in less habitat disturbance. Only the minimum amount of wood, sediment and other natural debris necessary to maintain culvert function will be removed; spawning gravel will not be disturbed.

2) All large wood, cobbles, and gravels recovered during cleaning will be placed downstream of the culvert.

3) Do all routine work in the dry. If this is not possible, follow work area isolation criteria outlined in the **General Conservation Measures Applicable to all Actions** (Page 7).

1h) Installation of Fords.

Description. In many streams, crossings have degraded riparian corridors and in-stream habitat resulting in increased and chronic sedimentation and reduced riparian functions including shading and recruitment of LW. Fords will be installed to allow improved stream crossing conditions only. New fords shall not be installed when there was not a previously existing stream crossing and no new fords will be constructed in salmonid spawning areas (including spawning and rearing habitat for bull trout). For the purposes of this proposed action, fords are defined as crossings for vehicles, off-highway vehicles (OHVs), bikes, pack animals, and livestock.

Guidelines for Review.

Low Risk: Fords that meet all conservation measures.

Medium Risk: Fords that do not meet all conservation measures shall require a review by the RRT.

Prior to going to the RRT, medium to high risk projects shall address the **General Project and Data Summary Requirements** (Page 50) in addition to the following:

1) Information detailing locations of ESA-listed salmonid spawning areas within the reach.

2) Designs must demonstrate that the ford accommodate reasonably foreseeable flood risks, including associated bedload and debris, and to prevent the diversion of streamflow out of the channel and down the trail if the crossing fails.

Conservation Measures:

1) Stream crossings shall be designed to the design benchmarks set in (NMFS 2011 or more recent version)[11].

2) The ford will not create barriers to the passage of adult and juvenile fish.

3) Ford stream crossings will involve the placement of river rock along the stream bottom.

4) Existing access roads or trails and stream crossings will be used whenever possible, unless new construction would result in less habitat disturbance and the old trail or crossing is retired.

[11] NMFS (National Marine Fisheries Service). 2011. Anadromous Salmonid Passage Facility Design. NMFS, Northwest Region, Portland, Oregon. Available at: http://www.nwr.noaa.gov/Publications/Reference-Documents/Passage-Refs.cfm

5) The ford will not be located in an area that will result in disturbance or damage to a properly functioning riparian area.

6) Fords will be placed on bedrock or stable substrates whenever possible.

7) Fords will not be placed in areas where ESA-listed salmonids (salmon, steelhead, bull trout) spawn or are suspected of spawning, or within 300 feet of such areas if spawning areas may be disturbed. For bull trout this CM applies to areas identified as spawning and rearing habitat.

8) Bank cuts, if any, will be stabilized with vegetation, and approaches and crossings will be protected with river rock (not crushed rock) when necessary to prevent erosion.

9) Fords will have a maximum width of 20 feet.

10) Fences will be installed (or are already existing and functioning) along with all new fords to limit access of livestock to riparian areas. Fenced off riparian areas will be maximized and planted with native vegetation. Fences will not inhibit upstream or downstream movement of fish or significantly impede bedload movement. Where appropriate, construct fences at fords to allow passage of large wood and other debris.

11) Vehicle fords will only be allowed in intermittent streams with no salmonid fish spawning.

River, Stream, Floodplain and Wetland Restoration.

The BPA proposes to review and fund river, stream, floodplain and wetland restoration actions with the objective to provide the appropriate habitat conditions required for foraging, rearing, and migrating ESA-listed fish.

Projects utilizing habitat restoration actions outlined within this activity category shall be linked to Limiting Factors identified within the appropriate sub basin plan, recovery plan or shall be prioritized by recommended restoration activities indentified within a localized region by a technical oversight and steering committee (i.e. the Columbia River Estuary). Individual projects may utilize a combination of the activities listed in the **River, Stream, Floodplain and Wetland Restoration** activity category.

The BPA proposes the following activities to improve fish habitat: (a) Improve Secondary Channel and Wetland Habitats, (b) Set-back or Removal of Existing, Berms, Dikes, and Levees; (c) Protect Streambanks Using Bioengineering Methods; (d) Install Habitat-Forming Natural Material Instream Structures (Large Wood, Boulders, and Spawning Gravel); (e) Riparian Vegetation Planting; and (f) Channel Reconstruction.

2a) Improve Secondary Channel and Wetland Habitats.

Description. The BPA proposes to review and fund projects that reconnect historical stream channels within floodplains, restore or modify hydrologic and other essential habitat features of historical river floodplain swales, abandoned side channels, spring-flow channels, wetlands, historical floodplain channels and create new self-sustaining side channel habitats which are maintained through natural processes.

Actions include the improvement and creation of secondary channels, off channel habitats and wetlands to increase the available area and access to rearing habitat; increase hydrologic capacity, provide resting areas for fish and wildlife species at various levels of inundation; reduce flow velocities; and provide protective cover for fish and other aquatic species.

Reconnection of historical off- and side channels habitats that have been blocked includes the removal of plugs, which impede water movement through off- and side-channels. Excavating pools and ponds in the historic floodplain/channel migration zone to create connected wetlands; Reconnecting existing side channels with a focus on restoring fish access and habitat forming processes (hydrology, riparian vegetation); Wetland habits will be created to reestablish a hydrologic regime that has been disrupted by human activities, including functions such as water depth, seasonal fluctuations, flooding periodicity, and connectivity.

All activities intended for improving secondary channel habitats will provide the greatest degree of natural stream and floodplain function achievable and shall be implemented to address basin specified limiting factors. The long-term development of a restored side channel will depend on natural processes like floods and mainstem migration.

If more than 20% of the amount of water from the main channel shall be diverted into the 2ndary channel then the action shall be considered Channel Reconstruction (pg. 46).

Guidelines for Review.

Medium or High Risk: All of the sub-activities under the Secondary Channel and Wetland habitats projects subcategory will require RRT review.

Prior to going to the RRT, medium to high risk projects shall address the **General Project and Data Summary Requirements** (Page 50) in addition to the following:

1) Evidence of historical channel location, such as land use surveys, historical photographs, topographic maps, remote sensing information, or personal observation.

2) If new side channel habitat is proposed, designs must demonstrate sufficient hydrology and that the project will be self-sustaining over time. Self-sustaining means the restored or created habitat would not require major or periodic maintenance, but function naturally within the processes of the floodplain.

3) Designs must demonstrate that the proposed action will mimic natural conditions for gradient, width, sinuosity and other hydraulic parameters.

4) Designs must demonstrate that the proposed action will not result in the creation of fish passage issues or post construction stranding of juvenile or adult fish.

Conservation Measures:

1) Off- and side-channel improvements can include minor excavation ($\leq$ 10%) of naturally accumulated sediment within historical channels. There is no limit as to the amount of excavation of anthropogenic fill within historic side channels as long as such channels can be clearly identified through field and/or aerial photographs.

2) Side channel habitat will be constructed to prevent fish stranding by providing a continual positive **overall** grade to the intersecting river or stream, or by providing a year-round water connection.

3) Excavated material removed from off- or side-channels shall be hauled to an upland site or spread across the adjacent floodplain in a manner that does not restrict floodplain capacity. Hydric soils may be salvaged to provide appropriate substrate and/or seed source for hydrophytic plant community development. Hydric soils will only be obtained from wetland salvage sites.

4) Excavation depth will never exceed the maximum thalweg depth in the main channel.

5) Restoration of existing side channels including one-time dredging and an up to two times project adjustment including adjusting the elevation of the created side channel habitat.

6) All side channel and pool habitat work will occur in isolation from waters occupied by ESA-listed salmonid species until project completion, at which time a final opening may be made by excavation to waters occupied by ESA-listed salmonid or water will be allowed to return into the area.

7) Adequate precautions will be taken to prevent the creation of fish passage issues or stranding of juvenile or adult fish unless the benefits of providing overwintering habitat for rearing juveniles can be demonstrated.

8) **Rewatering stream channels**. For stream channels which have been isolated and dewatered during project construction:
   a) Reconstructed stream channels will be “pre-washed” into a reach equipped with sediment capture devices, prior to reintroduction of flow to the stream.
   b) Stream channels will be re-watered slowly to minimize a sudden increase in turbidity.

2b) Set-back or Removal of Existing Berms, Dikes, and Levees.

Description: The BPA proposes to review and fund projects that reconnect estuary, stream and river channels with floodplains, increase habitat diversity and complexity, moderate flow disturbances, and provide refuge for fish during high flows by either removing existing berms, dikes or levees or increasing the distance that they are set back from active streams or wetlands. This action includes the removal of fill, such as dredge spoils from past channelization projects, road, trail, and railroad beds, dikes, berms, and levees to restore natural estuary and fresh-water floodplain functions. Such functions include overland flow during high flows, dissipation of flood energy, increased water storage to augment low flows, sediment and debris deposition, growth of riparian vegetation, nutrient cycling, and development of side channels and alcoves.

Techniques that are covered by this programmatic need to have the sole purpose of restoring floodplain and estuary functions or to enhance fish habitat. Covered actions in freshwater, estuarine, and marine areas include: 1) full and partial removal of levees, dikes, berms, and jetties; 2) breaching of levees, dikes, and berms; 3) lowering of levees, dikes, and berms; and, 4) setback of levees, dikes, and berms.

Guidelines for Review.

Medium or High Risk: All of the sub-activities under Set-back or removal of existing berms, dikes, and levees projects subcategory will require RRT review.

Prior to going to the RRT, medium to high risk projects shall address the **General Project and Data Summary Requirements** (Page 50)**.**

Conservation Measures:

1) To the greatest degree possible, nonnative fill material, originating from outside the floodplain of the action area will be removed from the floodplain to an upland site.

2) Where it is not possible to remove or set-back all portions of dikes and berms, or in areas where existing berms, dikes, and levees support abundant riparian vegetation, openings will be created with breaches.

3) Breaches shall be equal to or greater than the active channel width (as defined above) to reduce the potential for channel avulsion during flood events.

4) In addition to other breaches, the berm, dike, or levee shall always be breached at the downstream end of the project and/or at the lowest elevation of the floodplain to ensure the flows will naturally recede back into the main channel thus minimizing fish entrapment.

5) When necessary, loosen compacted soils once overburden material is removed.

6) Overburden or fill comprised of native materials, which originated from the project area, may be used within the floodplain to create set-back dikes and fill anthropogenic holes provided that does not impede floodplain function.

7) When full removal is not possible and a setback is required, the new structure locations should be prioritized to the outside of the meander belt width or to the outside or the channel meander zone margins.

2c) Protect Streambanks Using Bioengineering Methods.

Description. The BPA proposes to review and fund projects that restore eroding streambanks by bank shaping and installation of coir logs or other soil reinforcements – bioengineering techniques as necessary to support development of riparian vegetation and/or planting or installing large wood, trees, shrubs, and herbaceous cover as necessary to restore ecological function in riparian and floodplain habitats.

As techniques that are covered by this programmatic need to have the sole purpose of restoring floodplain and estuary functions or to enhance fish habitat, streambank stabilization shall only be proposed when there are additional interrelated and interdependent habitat restoration actions.

Streambank erosion often occurs within meandering alluvial rivers on the outside of meander bends. The rate of erosion and meander migration is often accelerated due to degradation of the stream side riparian vegetation and land use practices that have removed riparian woody species. Historically, as the river migrates into the adjacent riparian areas, LW would be recruited from the banks resulting in reduced near bank velocities and increased boundary roughness. Where a functional riparian area is lacking, the lateral bank erosion may occur at an unnaturally accelerated rate. The goal of streambank restoration is to reestablish long term riparian processes through re-vegetation and riparian buffer strips. Structural bank protection may be used to provide short term stability to banklines allowing for vegetation establishment.

The primary proposed structural streambank stabilization action is the use of large wood and vegetation to increase bank strength and resistance to erosion in an ecological approach to engineering streambank stabilization.

The following bioengineering techniques[12] are proposed for use either individually or in combination: (a) Woody plantings and variations (e.g., live stakes, brush layering, facines, brush mattresses); (b) herbaceous cover, for use on small streams or adjacent wetlands; (c) deformable soil reinforcement, consisting of soil layers or lifts strengthened with biodegradable coir fabric and plantings that are penetrable by plant roots; (d) coir logs (long bundles of coconut fiber), straw bales and straw logs used individually or in stacks to trap sediment and provide a growth medium for riparian plants; (e) bank reshaping and slope grading, when used to reduce a bank slope angle without changing the location of its toe, to increase roughness and cross section, and to provide more favorable planting surfaces; (f) tree and LW rows, live siltation fences, brush traverses, brush rows and live brush sills in floodplains, used to reduce the likelihood of avulsion in areas where natural floodplain roughness is poorly developed or has been removed and (g) floodplain flow spreaders, consisting of one or more rows of trees and accumulated debris used to spread flow across the floodplain; and (h) use of LW as a primary structural component.

[12] For detailed descriptions of each technique refer to the WDFW Integrated Streambank Protection Guidelines: http://wdfw.wa.gov/publications/00046/,the USACE's EMRRP Technical Notes, Stream Restoration: http://el.erdc.usace.army.mil/publications.cfm?Topic=technote&Code=emrrp, or the NRCS National Engineering Handbook Part 654, Stream Restoration: http://policy.nrcs.usda.gov/viewerFS.aspx?id=3491

Guidelines for Review.

Low Risk: Streambank projects with 1) bankfull flow less than 500 cfs; 2) height of bank less than 5 feet; 3) bankfull velocity less than 5 ft/sec., and that meet all conservation measures.

Medium or High Risk: Streambank projects with 1) bankfull flow greater than 500 cfs, or 2) height of bank greater than 5 feet; or 3) bankfull velocity greater than 5 ft/sec. Installation of any streambank project that does not meet all of the conservation measures.

Prior to going to the RRT, medium to high risk projects shall address the **General Project and Data Summary Requirements** (Page 50)**.**

Conservation Measures:

1) Without changing the location of the bank toe, damaged streambanks will be restored to a natural slope, pattern, and profile suitable for establishment of permanent woody vegetation. This may include sloping of unconsolidated bank material to a stable angle of repose, or the use of benches in consolidated, cohesive soils. The purpose of bank shaping is to provide a more stable platform for the establishment of riparian vegetation, while also reducing the depth to the water table, thus promoting better plant survival.

2) Streambank restoration projects shall include the placement of a riparian buffer strip consisting of a diverse assemblage of species native to the action area or region, including trees, shrubs, and herbaceous species. Do not use invasive species.

3) Large wood will be used as an integral component of all streambank protection treatments unless restoration can be achieved with soil bioengineering techniques alone.

4) LW will be placed to maximize near bank hydraulic complexity and interstitial habitats through use of various LW sizes and configurations of the placements.

5) Structural placement of LW should focus on providing bankline roughness for energy dissipation vs. flow re-direction that may affect the stability of the opposite bankline.

6) LW will be intact, hard, and undecayed to partly decaying with untrimmed root wads to provide functional refugia habitat for fish. Use of decayed or fragmented wood found lying on the ground may be used for additional roughness and to add complexity to LW placements but will not constitute the primary structural components.

7) Wood that is already within the stream or suspended over the stream may be repositioned to allow for greater interaction with the stream.

8) LW anchoring will not utilize cable or chain. Manila, sisal or other biodegradable ropes may be used for lashing connections. If hydraulic conditions warrant use of structural connections then rebar pinning or bolting may be used. The utilization of structural connections should be used minimally and only to ensure structural longevity in high energetic systems such as

(high gradient systems with lateral confinement and limited floodplain). Need for structural anchorage shall be demonstrated in the design documentation.

9) Rock will not be used for streambank restoration, except as ballast to stabilize large wood unless it is necessary to prevent scouring or downcutting of an existing flow control structure (*e.g.*, a culvert or bridge support, headwall, utility lines, or building). In this case rock may be used as the primary structural component for construction of vegetated riprap with large woody debris. Scour holes may be filled with rock to prevent damage to structure foundations but will not extend above the adjacent bed of the river. This does not include scour protection for bridge approach fills.

10) The rock may not impair natural stream flows into or out of secondary channels or riparian wetlands.

11) Fencing will be installed as necessary to prevent access and grazing damage to revegetated sites and project buffer strips.

12) Riparian buffer strips associated with streambank protection shall extend from the project bankline towards the floodplain a minimum distance of 35 feet.

2d) Install Habitat-Forming Natural Material Instream Structures (Large Wood, Boulders, and Spawning Gravel)[13].

Description. The BPA proposes to review and fund projects that include placement of natural habitat forming structures to provide instream spawning, rearing and resting habitat for salmonids and other aquatic species. Projects will provide high flow refugia; increase interstitial spaces for benthic organisms; increase instream structural complexity and diversity including rearing habitat and pool formation; promote natural vegetation composition and diversity; reduce embeddedness in spawning gravels and promote spawning gravel deposition; reduce siltation in pools; reduce the width/depth ratio of the stream; mimic natural input of LW (e.g., whole conifer and hardwood trees, logs, root wads); decrease flow velocities; and deflect flows into adjoining floodplain areas to increase channel and floodplain function. In areas where natural gravel supplies are low (immediately below reservoirs, for instance), gravel placement can be used to improve spawning habitat.

Anthropogenic activities that have altered riparian habitats, such as splash damming and the removal of large wood and logjams, have reduced instream habitat complexity in many rivers and have eliminated or reduced features like pools, hiding cover, and bed complexity. Salmonids need habitat complexity for rearing, feeding, and migrating. To offset these impacts large wood, boulders and spawning gravel will be placed in stream channels either individually or in combination.

Large wood will be placed to increase coarse sediment storage, increase habitat diversity and complexity, retain gravel for spawning habitat, improve flow heterogeneity, provide long-term nutrient storage and substrate for aquatic macroinvertebrates, moderate flow disturbances, increase retention of leaf litter, and provide refugia for fish during high flows. Engineered log jams create a hydraulic shadow, a low-velocity zone downstream that allows sediment to settle out. Scour holes develop adjacent to the log jam which can provide valuable fish and wildlife habitat by redirecting flow and providing stability to a streambank or downstream gravelbar. Boulder placements increase habitat diversity and complexity, improve flow heterogeneity, provide substrate for aquatic vertebrates, moderate flow disturbances, and provide refuge for fish during high flows. The placement of individual large boulders and boulder clusters to increase structural diversity is important to provide holding and rearing habitat for ESA-listed salmonids where similar natural rock has been removed. This treatment will be used in streams that have been identified as lacking structural diversity and that are naturally and/or historically have had boulders.

The quality and quantity of available spawning gravel has been impacted by many anthropogenic features and activities. For example, dams and culverts can block the downstream movement of

[13] For detailed descriptions of each technique refer to the WDFW Stream Habitat Restoration Guidelines: http://wdfw.wa.gov/publications/pub.php?id=00043, WDFW Integrated Streambank Protection Guidelines: http://wdfw.wa.gov/publications/00046/,the USACE's EMRRP Technical Notes, Stream Restoration: http://el.erdc.usace.army.mil/publications.cfm?Topic=technote&Code=emrrp, or the NRCS National Engineering Handbook Part 654, Stream Restoration: http://policy.nrcs.usda.gov/viewerFS.aspx?id=3491

gravel and result in gravel starved reaches. Channelization, hard streambank stabilization, and diking restrict a stream from meandering and recruiting gravel. Elimination of riparian buffers and grazing up to the stream's edge introduces fines that often cause embedded or silted-in spawning gravel. Spawning gravel will be placed to improve spawning substrate by compensating for an identified loss of a natural gravel supply and may be placed in conjunction with other projects, such as simulated log jams and boulders.

All activities intended for installing habitat-forming instream structures will provide the greatest degree of natural stream and floodplain function achievable through application of an integrated, ecological approach and linkage to basin defined limiting factors. Instream structures capable of enhancing habitat forming processes and migratory corridors will be installed only within previously degraded stream reaches, where past disturbances have removed habitat elements such as LW, boulders, or spawning gravel.

This project activity category can only be covered if ancillary to other stream habitat restoration actions.

Guidelines for Review.

Low Risk: Installation of habitat forming structures that meet all conservation measures.

Medium or High Risk: Installation of habitat forming structures that do not meet all conservation measures.

Prior to going to the RRT, medium to high risk projects shall address the **General Project and Data Summary Requirements** (Page 50) in addition to the following:

1) Designs must demonstrate that the large wood placements mimic natural accumulations of large wood in the channel, estuary, or marine environment and addresses basin defined limiting factors.

2) Designs must demonstrate that boulder placements will be limited to stream reaches with an intact, well-vegetated riparian area, including trees and shrubs where those species would naturally occur, or that are part of riparian area restoration action; and a stream bed that consists predominantly of coarse gravel or larger sediments.

3) Designs must demonstrate that boulder sizing is appropriate for the size of the stream, maximum depth of flow, planform, entrenchment, and ice and debris loading.

4) For systems where boulders were not historically a component of the project stream reach, it must be demonstrated how this use of this technique will address limiting factors and provide the appropriate post restoration habitats.

5) Designs must demonstrate that LW and boulder placements will not result in a fish passage barrier.

6) Designs must demonstrate that spawning gravel augmentation is limited to areas where the natural supply has been eliminated or significantly reduced through anthropogenic means.

Conservation Measures (Large Wood).

1) LW placements for other purposes than habitat restoration or enhancement are excluded from this consultation.

2) LW will be placed in channels that have an intact, well-vegetated riparian buffer area that is not mature enough to provide large wood, or in conjunction with riparian rehabilitation or management.

3) LW may partially or completely span the channel in first order streams if the active channel top width is less than 20 feet.

4) When available and if the project is located within the appropriate morphology and sized stream, trees with rootwads attached should be a minimum length of 1.5 times the bankfull channel width, while logs without rootwads should be a minimum of 2.0 times the bankfull width.

5) Stabilizing or key pieces of large wood that will be relied on to provide streambank stability or redirect flows must be intact, hard, and undecayed to partly decaying, and should have untrimmed root wads to provide functional refugia habitat for fish. Use of decayed or fragmented wood found lying on the ground or partially sunken in the ground is not acceptable for key pieces but may be incorporated to add habitat complexity.

6) The partial burial of LW and boulders may constitute the dominant means of placement and key boulders (footings) or LW can be buried into the stream bank or channel.

7) LW anchoring will not utilize cable or chain. Manila, sisal or other biodegradable ropes may be used for lashing connections. If hydraulic conditions warrant use of structural connections then rebar pinning or bolting may be used. The utilization of structural connections should be used minimally and only to ensure structural longevity in high energetic systems such as (high gradient systems with lateral confinement and limited floodplain). Need for structural anchorage shall be demonstrated in the design documentation.

8) Rock may be used for ballast but is limited to that is needed to anchor the LW.

Conservation Measures (Boulder Placement)

1) Boulder placements for other purposes than habitat restoration or enhancement are not covered under HIPIII.

2) The cross-sectional area of boulder placements may not exceed 25% of the cross-sectional area of the low flow channel, or be installed to shift the stream flow to a single flow pattern in the middle or to the side of the stream.

3) Boulders will be machine-placed (no end dumping allowed) and will rely on the size of boulder for stability.

4) Boulders will be installed low in relation to channel dimensions so that they are completely overtopped during channel-forming flow events (approximately a 1.5-year flow event).

5) Permanent anchoring, including rebar or cabling, may not be used.

Conservation Measures (Spawning Gravel)

1) Spawning gravel to be placed in streams must be obtained from an upland source outside of the channel and riparian area and properly sized gradation for that stream, clean, and non-angular. When possible use gravel of the same lithology as found in the watershed. After spawning gravel placement, allow the stream to naturally sort and distribute the material.

2) A maximum of 100 cubic yards of spawning sized gravel can be imported or relocated and placed upstream of each structure when in combination with other restoration activities that address the underlying systematic problem. For example a combined project consisting of: planting streambank vegetation, placing instream LW and supplementing spawning gravel.

3) Imported gravel must be free of invasive species and non-native seeds.

2e) Riparian Vegetation Planting.

Description. The BPA proposes to fund vegetation planting to recover watershed processes and functions associated with native plant communities and that will help restore natural plant species composition and structure. Under this activity category, project proponents would plant trees, shrubs, herbaceous plants, and aquatic macrophytes to help stabilize soils. Large trees such as cottonwoods and conifers will be planted in areas where they historically occurred but are currently either scarce or absent. Native plant species and seeds will be obtained from local sources to ensure plants are adapted to local climate and soil chemistry.

Vegetation management strategies will be utilized that are consistent with local native succession and disturbance regimes and specify seed/plant source, seed/plant mixes, and soil preparation. Planting will address the abiotic factors contributing to the sites' succession, *i.e*., weather and disturbance patterns, nutrient cycling, and hydrologic condition. Only certified noxious weed-free seed (99.9%), hay, straw, mulch, or other vegetation material for site stability and revegetation projects will be utilized.

Guidelines for Review.

Low Risk: Riparian vegetation planting is considered low-risk and requires no review.

Conservation Measures.

1) An experienced silviculturist, botanist, ecologist, or associated technician shall be involved in designing vegetation treatments.

2) Species to be planted must be of the same species that naturally occurs in the project area.

3) Tree and shrub species as well as sedge and rush mats to be used as transplant material shall come from outside the bankfull width, typically in abandoned flood plains, and where such plants are abundant.

4) Sedge and rush mats should be sized as to prevent their movement during high flow events.

5) Concentrate plantings above the bankfull elevation.

6) Species distribution shall mimic natural distribution in the riparian and floodplain areas.

2f) Channel Reconstruction.

Description. The BPA proposes to review and fund channel reconstruction projects to improve aquatic and riparian habitat diversity and complexity, reconnect stream channels to floodplains, reduce bed and bank erosion, increase hyporheic exchange, provide long-term nutrient storage, provide substrate for macroinvertebrates, moderate flow disturbance, increase retention of organic material, and provide refuge for fish and other aquatic species by reconstructing stream channels and floodplains that are compatible within the appropriate watershed context and geomorphic setting.

The reconstructed stream system shall be composed of a naturally sustainable and dynamic planform, cross-section, and longitudinal profile that incorporates unimpeded passage and temporary storage of water, sediment, organic material, and species. Stream channel adjustment over time is to be expected in naturally dynamic systems and is a necessary component to restore a wide array of stream functions. It is expected that for most projects that there will be a primary channel with secondary channels that are activated at various flow levels to increase floodplain connectivity and to improve aquatic habitat through a range of flows. This proposed action is not intended to artificially stabilize streams into a single location or into a single channel for the purposes of protecting infrastructure or property.

Channel reconstruction consists of re-meandering or movement of the primary active channel, and may include structural elements such as streambed simulation materials, streambank restoration, and hydraulic roughness elements. For bed stabilization and hydraulic control structures, constructed riffles shall be preferentially used in pool-riffle stream types, while roughened channels and boulder weirs shall be preferentially used in step-pool and cascade stream types. Material selection (large wood, rock, gravel) shall also mimic natural stream system materials.

Guidelines for Review.

Medium Risk: Channel Reconstruction that restores historical alignment with minimal excavation shall require both RRT and NMFS Hydro Review.

High Risk: Channel Reconstruction that create entirely new channel meanders through significant excavation shall require RRT, NMFS Hydro Review, and Interagency Review.

High Risk projects in the Channel Reconstruction activity shall address the **General Project and Data Summary Requirements** (Page 50), the following **Conservation Measures**, and include a **Monitoring and Adaptive Management Plan** (Page 47).

Conservation Measures:

Data requirements for RRT & NMFS review and analysis include:

1) Detailed construction drawings

2) Designs must demonstrate that channel reconstruction will identify, correct to the extent possible, and then account for in the project development process, the conditions that lead to the degraded condition.

3) Designs must demonstrate that the proposed action will mimic natural conditions for gradient, width, sinuosity and other hydraulic parameters.

4) Designs must demonstrate that structural elements shall fit within the geomorphic context of the stream system.

5) Designs must demonstrate sufficient hydrology and that the project will be self-sustaining over time. Self-sustaining means the restored or created habitat would not require major or periodic maintenance, but function naturally within the processes of the floodplain.

6) Designs must demonstrate that the proposed action will not result in the creation of fish passage issues or post construction stranding of juvenile or adult fish.

Monitoring and Adaptive Management Plan.

1) Introduction
2) Existing Monitoring Protocols
3) Project Effectiveness Monitoring Plan
    a) Objective 1
    b) Objective 2
4) Project Review Team Triggers
5) Monitoring Frequency, Timing, and Duration
    a) Baseline Survey
    b) As-built Survey
    c) Monitoring Site Layout
    d) Post-Bankfull Event Survey
    e) Future Survey (related to flow event)
6) Monitoring Technique Protocols
    a) Photo Documentation and Visual Inspection
    b) Longitudinal Profile
    c) Habitat Survey
    d) Survival Plots
    e) Channel and Floodplain Cross-sections
    f) Fish Passage
    g) Other
7) Data Storage and Analysis
8) Monitoring Quality Assurance Plan
9) Literature Cited

9e) Tree Removal for LW Projects.

Description. Live conifers and other trees can be felled or pulled/pushed over in a Northwest Forest Plan (USDA and USDI 1994b) Riparian Reserve or PACFISH/INFISH (USDA-Forest Service 1995; USDA and USDI 1994a) riparian habitat conservation areas (RHCA), and upland areas (e.g., late successional reserves or adaptive management areas for northern spotted owl and marbled murrelet critical habitat) for in-channel LW placement only when conifers and trees are fully stocked. Tree felling shall not create excessive stream bank erosion or increase the likelihood of channel avulsion during high flows. Trees may be removed by cable, ground-based equipment, or helicopter. Danger trees and trees killed through fire, insects, disease, blow-down and other means can be felled and used for in-channel placement regardless of live-tree stocking levels. Trees may be felled or pushed/pulled directly into a stream or floodplain. Trees may be stock piled for future instream restoration projects. The project manager for an aquatic restoration action will coordinate with an action-agency wildlife biologist in tree-removal planning efforts.

Conservation Measures
The purpose of these criteria is to ensure that there would be no removal or adverse modification of suitable habitat for marbled murrelet or spotted owl.

1) The following Conservation Measures apply to tree removal within the range of marbled murrelets and the spotted owl in Douglas-fir dominated stands less than 80 years old that are not functioning as foraging habitat within a spotted owl home range and do not contain murrelet nesting structure. It does not apply to tree selection in older stands or hardwood-dominated stands unless stated otherwise.
    a) A wildlife biologist must be fully involved in all tree-removal planning efforts, and be involved in making decisions on whether individual trees are suitable for nesting or have other important listed bird habitat value.
    b) Outside of one site potential tree height of streams, trees can be removed to a level not less than a Relative Density (RD) of approximately 35 (stand scale), which is considered as fully occupying a site. This equates to approximately 60 trees per acre in the overstory and a tree spacing averaging 26 feet. Additionally 40% canopy cover would be maintained when in spotted owl or marbled murrelet CH, when within 300 feet of occupied or unsurveyed murrelet nesting structure, and when dispersal habitat is limited in the area.
    c) Tree species removed should be relatively common in the stand (i.e., not “minor” tree species).
    d) Snags and trees with broad, deep crowns (“wolf” trees), damaged tops or other abnormalities that may provide a valuable wildlife habitat component can not be removed.
    e) No gaps (openings) greater than 0.5 acre will be created in spotted owl CH. Nogaps greater than ¼ acre will be created in murrelet CH. No gaps shall be created in Riparian Reserves that contain ESA-listed fish habitat.

2) The following conservation measures applies to tree removal within the range of

marbled murrelet and the spotted owl in Douglas-fir dominated stands greater than 80 years old or that are functioning as foraging habitat within a spotted owl home range, and/or do contain marbled murrelet nesting structure.

a) Individual trees or small groups of trees should come from the periphery of permanent openings (roads etc.) or from the periphery of non-permanent openings (e.g., plantations, along recent clear-cuts etc.). Groups of trees greater than 4 trees shall
    i) Not be removed from within marbled murrelet suitable stands or stands buffering (300 ft.) MM suitable stands,
    ii) not be buffering (300 ft.) individual trees with marbled murrelet nesting structure. A minimum distance of one potential tree height feet should be maintained between individual or group removals.
b) Trees up to 36" dbh may be felled in any stands with agreement from an FWS wildlife biologist that the trees are not providing marbled murrelet nesting structures or providing cover for nest sites. No known spotted owl nest trees or alternate nest trees are to be removed. Potential spotted owl nest trees may only be removed in limited instances when it is confirmed with the FWS wildlife biologist that nest trees will not be limited in the stand post removal.

c) In order to minimize the creation of canopy gaps or edges, groups of adjacent trees selected should not create openings greater than ¼ acre within 0.5 miles of marbled murrelet occupied habitat or when within murrelet CH. Within spotted owl critical habitat, stands greater than 80 years old or within stands providing foraging habitat to spotted owl home ranges, gaps will be restricted to 0.5 acre openings or less. Gaps shall not be created in Riparian Reserves where ESA-listed fish occur.

General Project and Data Summary Requirements (GPDSR).

The GPDSR serves as the submittal design submittal framework that is needed to assess and evaluate the adequacy of the proposed project.

The BPA RRT will review submitted GPDSR documents to determine if the technical deliverables provided are adequate for functionality (adherence to HIPIII Conservation Measures) and technical quality (competent execution of design and project plans – contract documents).

A Checklist format of the GPDSR is available, ask your EC Lead.

Project Background.

1. Name and titles of sponsor, firms and individuals responsible for design.
2. List of project elements that have been designed by a licensed Professional Engineer.
3. Identification and description of risk to infrastructure or existing resources.
4. Explanation and background on fisheries use (by life stage - period) and limiting factors addressed by project.
5. List of primary project features including constructed or natural elements.
6. Description of performance / sustainability criteria for project elements and assessment of risk of failure to perform, potential consequences and compensating analysis to reduce uncertainty.
7. Description of disturbance including timing and areal extent and potential impacts associated with implementation of each element.

Resource Inventory and Evaluation.

1. Description of past and present impacts on channel, riparian and floodplain conditions.
2. Instream flow management and constraints in the project reach.
3. Description of existing geomorphic conditions and constraints on physical processes.
4. Description of existing riparian condition and historical riparian impacts.
5. Description of lateral connectivity to floodplain and historical floodplain impacts.
6. Tidal influence in project reach and influence of structural controls (dikes or gates).

Technical Data.

1. Incorporation of HIPIII specific Activity Conservation Measures for all included project elements.
2. Summary of site information and measurements (survey, bed material, etc.) used to support assessment and design.
3. Summary of hydrologic analyses conducted, including data sources and period of record including a list of design discharge (Q) and return interval (RI) for each design element.
4. Summary of sediment supply and transport analyses conducted, including data sources including sediment size gradation used in streambed design.
5. Summary of hydraulic modeling or analyses conducted and outcomes – implications relative to proposed design.
6. Stability analyses and computations for project elements, and comprehensive project plan.

7. Description of how preceding technical analysis has been incorporated into and integrated with the construction – contract documentation.

Construction – Contract Documentation.

1. Incorporation of HIPIII General and Construction Conservation Measures
2. Design – construction plan set including but not limited to plan, profile, section and detail sheets that identify all project elements and construction activities of sufficient detail to govern competent execution of project bidding and implementation.
3. List of all proposed project materials and quantities.
4. Description of best management practices that will be implemented and implementation resource plans including:
    a) Site Access Staging and Sequencing Plan with description
    b) Work Area Isolation and Dewatering Plan with description of how aquatic organisms within the action area will be treated / protected.
    c) Erosion and Pollution Control Plan.
    d) Site Reclamation and Restoration Plan
    e) List proposed equipment and fuels management plan.
5. Calendar schedule for construction/implementation procedures.
6. Site or project specific monitoring to support pollution prevention and/or abatement.

HIPIII Forms – Project Notification From (PNF).

B O N N E V I L L E P O W E R A D M I N I S T R A T I O N

HIP III PROGRAMMATIC - CONSULTATION
PROJECT NOTIFICATION FORM
HIP III No:

Lead Action Agency: BPA			
NMFS Tracking #: 2013/9724	**Statutory Authority:** ☐ ESA & EFH ☐ ESA		**USFWS Tracking #: 01EOFW00-2013-F-0199**
Date of Request:	DATE		
Project Title:	Click here to enter text.		
BPA Project #:	Click here to enter text.	**Contract #:**	Click here to enter text.
BPA EC Contact:	Click here to enter text.	**Phone:**	Click here to enter text.
Project Sponsor Contact:	Click here to enter text.	**Phone:**	Click here to enter text.
Project Affiliation:	Click here to enter text.		
NMFS Branch Office:	**Choose a NMFS Branch Office**		
USFWS Field Office:	**Choose a USFWS Field Office**		
Lat/Long: (in decimal degrees, WGS84)	Click here to enter text.	**County:**	Choose a County.
6th Field HUC:	Click here to enter text.	**HUC Name:**	Click here to enter text.

Project Start Date:	DATE	**Project End Date:**	DATE	**Completed Form Due Date:**	DATE

***(Project** Completion Form and/or Herbicide Use Form due ≤60-days after Project End Date)*

Does the project consist of Invasive Plant Control only?	Yes ☐	No☐
Does the project require near- and/or in-water construction?	Yes ☐	No☐
Does the project require near- and/or in-water work (no construction)?	Yes ☐	No☐
Does the project require work area isolation/fish salvage?	Yes ☐	No☐
Does the project require a variance?	Yes ☐	No☐

B O N N E V I L L E P O W E R A D M I N I S T R A T I O N

Project Description

List the project activities and describe the intended result(s); tell when the project is to occur; describe how the activities will be implemented; provide any other pertinent information. Please include Work Element for each activity.

Click here to enter text.

Variance Request

Describe how the effects of the requested variance fall within the range of effects described for the proposed activities in the HIP III Opinion, by addressing the following:

1) *Define the requested variance and the relevant criterion by page number.*
2) *Environmental conditions anticipated at the time of the proposed work (flow and weather conditions).*
3) *Biological justification as to why a variance is necessary and a brief rationale why the variance will either provide a conservation benefit or, at a minimum, not cause additional adverse effects beyond the scope of the Opinion.*
4) *Include as attachments any necessary approvals from state agencies.*

Click here to enter text.

NMFS Species/Critical Habitat Present in Action Area:

Anadromous Fish:

- ☐ Lower Columbia River Chinook
- ☐ Lower Columbia River coho
- ☐ Lower Columbia River steelhead
- ☐ Middle Columbia River steelhead
- ☐ Upper Columbia River spring-run Chinook
- ☐ Upper Columbia River steelhead
- ☐ Columbia River chum
- ☐ Green sturgeon
- ☐ Upper Willamette River Chinook
- ☐ Upper Willamette River steelhead
- ☐ Snake River spring/summer-run Chinook
- ☐ Snake River fall-run Chinook
- ☐ Snake River Basin steelhead
- ☐ Snake River sockeye
- ☐ Pacific eulachon

Essential Fish Habitat Species:

- ☐ Salmon (West Coast Salmon FMP)
- ☐ Estuarine Composite (Ground fish, pelagics)

USFWS Species/Critical Habitat Present in Action Area:

Freshwater Fish Species:

- ☐ Bull Trout

Mammalian Species:

- ☐ Canada lynx*
- ☐ Columbia white-tailed deer*
- ☐ Gray wolf*
- ☐ Grizzly bear*
- ☐ North American wolverine
- ☐ Pygmy rabbit*
- ☐ Northern Idaho ground squirrel*
- ☐ Woodland caribou*

Avian Species:

- ☐ Marbled murrelet
- ☐ Northern spotted owl
- ☐ Streaked horned lark*
- ☐ Western snowy plover

Invertebrate Species:

- ☐ Banbury Springs limpet
- ☐ Bliss Rapids snail*
- ☐ Bruneau Hot springsnail*
- ☐ Fender's blue butterfly
- ☐ Taylor's checkerspot butterfly
- ☐ Snake River physa snail*
- ☐ Oregon silverspot butterfly

B O N N E V I L L E P O W E R A D M I N I S T R A T I O N

Plant Species:

- ☐ Bradshaw's lomatium
- ☐ Cook's lomatium
- ☐ Gentner's fritillary
- ☐ Golden paintbrush
- ☐ Howell's spectacular thelypody
- ☐ Kincaid's lupine
- ☐ Large-flowered wooly meadowfoam
- ☐ Malheur wire-lettuce
- ☐ McFarlane's four o'clock
- ☐ Nelson's checkermallow
- ☐ Rough popcorn flower
- ☐ Showy stickseed
- ☐ Slickspot peppergrass
- ☐ Spalding's catchfly
- ☐ Umtanum Desert buckwheat
- ☐ Ute ladies' tresses
- ☐ Water howellia
- ☐ Wenatchee Mountain checkermallow
- ☐ Western lily
- ☐ White Bluffs bladderpod
- ☐ Willamette daisy

Types of Action:

Identify the types of action(s) proposed.

1. Fish Passage Restoration (Profile Discontinuities)

- ☐ a. Dams, Water Control or Legacy Structure Removal
- ☐ b. Consolidate, or Replace Existing Irrigation Diversions
- ☐ c. Headcut and Grade Stabilization
- ☐ d. Low Flow Consolidation
- ☐ e. Providing Fish Passage at an Existing Facility

Fish Passage Restoration (Transportation Infrastructure)

- ☐ f. Bridge and Culvert Removal or Replacement
- ☐ g. Bridge and Culvert Maintenance
- ☐ h. Installation of Fords

2. River, Stream, Floodplain, and Wetland Restoration

- ☐ a. Improve Secondary Channel and Wetland Habitats
- ☐ b. Set-back or Removal of Existing, Berms, Dikes, and Levees
- ☐ c. Protect Streambanks Using Bioengineering Methods
- ☐ d. Install Habitat-Forming Natural Material Instream Structures (Large Wood, Boulders, and Spawning Gravel)
- ☐ e. Riparian Vegetation Planting
- ☐ f. Channel Reconstruction*

3. Invasive and Non-Native Plant Control

- ☐ a. Manage Vegetation using Physical Controls
- ☐ b. Manage Vegetation using Herbicides

4. Piling Removal.

- ☐ Piling Removal

5. Road and Trail Erosion Control, Maintenance, and Decommissioning

- ☐ a. Maintain Roads
- ☐ b. Decommission Roads

6. In-channel Nutrient Enhancement

- ☐ In-channel Nutrient Enhancement

7. Irrigation and Water Delivery/Management Actions

- ☐ a. Convert Delivery System to Drip or Sprinkler Irrigation
- ☐ b. Convert Water Conveyance from Open Ditch to Pipeline or Line Leaking Ditches or Canals
- ☐ c. Convert from Instream Diversions to Groundwater Wells for Primary Water Sources
- ☐ d. Install or Replace Return Flow Cooling Systems
- ☐ e. Install Irrigation Water Siphon Beneath Waterway
- ☐ f. Livestock Watering Facilities
- ☐ g. Install New or Upgrade/Maintain Existing Fish Screens

8. Fisheries, Hydrologic, and Geomorphologic Surveys

- ☐ Fisheries, Hydrologic, and Geomorphologic Surveys

9. Special Actions (Terrestrial Species)

- ☐ a. Install/develop Wildlife Structures
- ☐ b. Fencing Construction for Livestock Control
- ☐ c. Implement Erosion Control Practices
- ☐ d. Plant Vegetation
- ☐ e. Tree Removal for LW Projects

B O N N E V I L L E P O W E R A D M I N I S T R A T I O N

NMFS Hydro Division Review

Does the project require approval from NMFS Hydro Division for:

Fish Passage Restoration **(Profile Discontinuities)**	Yes ☐	No ☐	Approval Date: DATE
Install New or Upgrade/Maintain Existing Fish Screens	Yes ☐	No ☐	Approval Date: DATE
Channel Reconstruction	Yes ☐	No ☐	Approval Date: DATE

USFWS Terrestrial Species Review

Does the project require confirmation of NLAA Effects determination for:

Mammalian Species	Yes ☐	No ☐	Approval Date: DATE
Invertebrate Species	Yes ☐	No ☐	Approval Date: DATE
Avian Species	Yes ☐	No ☐	Approval Date: DATE
Plant Species	Yes ☐	No ☐	Approval Date: DATE

RRT REVIEW

Are there any Med or High Risk projects that require RRT review? Yes ☐ No ☐

Date of RRT submittal: DATE Date of RRT Approval: DATE RRT Reviewer:

BPA Determination of Consistency with all Requirements of the HIP III Consultation

The BPA must certify that the proposed project is consistent with all requirements and applicable terms and conditions of the HIP III Consultation.

BPA EC Contact (constitutes your electronic signature):

Date of Certification: DATE

HIPIII Forms – Project Completion (PCF).

B O N N E V I L L E P O W E R A D M I N I S T R A T I O N

PROJECT COMPLETION REPORTING

HIP III No:

*Within **60 days** of completing a project covered under the HIP III programmatic biological opinion, Bonneville Power Administration staff will review and submit this completed form with the following information to the project sponsor and-to NMFS at hip.nwr@noaa.gov and USFWS at hip@fws.gov.*

Project Title:	**Click here to enter text.**		
Date of Submittal:	DATE		
BPA Project #:	Click here to enter text.	**Contract #:**	Click here to enter text.

Project Activity Start and End Dates:

Work Element	In-water Activities	Start Date	End Date
	Click here to enter text.	DATE	DATE
	Click here to enter text.	DATE	DATE
	Click here to enter text.	DATE	DATE
	Click here to enter text.	DATE	DATE
	Click here to enter text.	DATE	DATE

Fish Capture Reporting

The BPA will report the following information for all projects that involve work area isolation with associated fish capture and relocation. When available, provide a tally of ESA-listed salmonids by species (salmon or steelhead) and life stage.

Fish Capture Lead (name, contact info)	Click here to enter text.

Type of take	Interior Columbia Basin	Lower Columbia (Hood River downstream)	Bull Trout
Number of salmonids Captured	Click here to enter text.	Click here to enter text.	Click here to enter text.
Number of salmonids Injured	Click here to enter text.	Click here to enter text.	Click here to enter text.
Number of salmonids Killed	Click here to enter text.	Click here to enter text.	Click here to enter text.

1 of 2

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B O N N E V I L L E P O W E R A D M I N I S T R A T I O N

Turbidity Reporting

The Project Sponsor shall complete and record the following water quality observations to ensure that any increase in suspended sediment is not exceeding the limit for HIP III compliance.

Monitoring Individual (name, contact info)

Size of Stream		Measurement Compliance Point*
<30 feet	☐	*50 feet downstream*
>30 & <100feet	☐	*100 feet downstream*
>100feet	☐	*200 feet downstream*
Tidal	☐	*300 feet downcurrent*

Predominant Stream Bottom Characteristics (Use % if possible)		
Clay	☐	
Silt	☐	
Sand	☐	
Gravel	☐	
Rock	☐	

Work Element	Date	Start		Start +2 hrs	Start +4 hrs	Start + 6 hrs	Start + 8 hrs	COMMENTS – if turbidity was visible at interim checks, how was work modified to reduce turbidity? What special circumstances led to exceedance?
		In-water work Start Time	Back-ground Measurement	Measured Turbidity (NTUs) or (Yes/No) for observed difference.				
Maximum Linear extent of observed turbidity downstream (ft)						Is Turbidity Plume Channel Spanning?		Yes ☐ No ☐

Instructions: First take a background measurement approximately 100 ft up-stream in undisturbed water. Then take a 2nd measurement down stream of work site at the measurement compliance point*. If the downstream observed turbidity visibly exceeds background turbidity greater than 10% or more of the background NTU measurement modify BMPs and continue to monitor every 2 hours. If exceedance continues for second monitoring interval (2 intervals in a row) STOP WORK until turbidity resumes to background and notify EC lead.

Narrative Assessment

Provide a narrative assessment of the project sponsor's success in meeting all requirements including the terms and conditions of the HIP III BO consultation. Please include:

- Photos of habitat conditions before, during, and after action completion.
- Evidence of compliance with fish screen criteria, for any pump used in fish-bearing waters.
- A summary of the results of pollution and erosion control inspections, including any erosion control failure, turbidity in exceedance of HIP III standards, contaminant release, and correction effort.
- A description of the post-project condition of any riparian area cleared within 150 feet of Ordinary High Water.
- A description of site restoration completed and future site restoration plans.
- A description of any project activities that were not implemented or differ from what was proposed.
- Any issues that were encountered during implementation or lessons learned.

The Restoration Review Team (RRT) process.

What is the RRT?

Under the HIP III, BPA will use an internal QA/QC process on medium- to high-risk projects in the **Fish Passage Restoration** activity category and the **River, Stream, Floodplain and Wetland Restoration** activity category to (a) meet the obligations set forth in the National Marine Fisheries Service (NMFS)/United States Fish and Wildlife Service (USFWS) Biological Opinions within the action area, (b) promote interagency collaboration, (c) maximize ecological benefits of restoration and recovery projects, (d) facilitate site visits and types of review and (d) ensure consistent use and implementation throughout the geographic areas covered by the NMFS/USFWS BO.

Risk for the purposes of the RRT is defined primarily as risk to Endangered Species Act (ESA)-listed species and their habitats, but can be applied to include, but is not limited to: (a) Precedent- and/or policy-setting actions, such as the application of new technology, (b) actions that are not necessarily new, but are new to a geographic area or stakeholder group, and (c) actions with which the project manager, sponsor, or ECL Lead is unfamiliar, regardless of the relative risk.

Another purpose of the RRT is to provide updates and clarifications of the USFWS/NMFS HIP III BOs to all users to ensure consistent use, and to resolve inconsistencies and obtain clarification from the Services when needed.

The RRT does not replace any existing review process, nor shall it slow down project permitting and implementation unless there are significant technical, policy, and/or program concerns with a particular restoration approach.

What types of projects require review by the RRT?

The BPA Environmental Compliance Lead (ECL), using guidance developed by the RRT, shall screen projects and forward only the medium and high risk projects to the RRT for review. Low-risk projects would proceed along normal channels for HIP compliance.

The RRT shall only review **medium** to **high** risk projects within the Fish Passage Restoration activity category and the River, Stream, Floodplain and Wetland Restoration activity category.

Who is on the RRT?

The following members are all internal BPA team members:

- Restoration Review Team Leader
- Core Team Members
  - KEC
  - KEW
- Technical Team: (KEC, KEW Subject Matter Experts)

What is the RRT review process for medium-risk projects, and how long does this take?

Sponsor provides conceptual designs to EC Lead.
EC Lead makes risk determination.
EC Lead provides to sponsor:

- Latest version of Project Notification Form (PNF)
- Latest version of Project Completion Form (PCF)
- Conservation Measures Checklist
- General Project and Data Summary Requirements Checklist (GPDSR)

Sponsor signs checklists, submits information requirements, and fills out PNF Form.
EC Lead submits project to RRT.

- RRT functional review begins (total duration 2-8 weeks)
- If RRT does not approve design, resubmit with changes.
- When RRT approves design,
- RRT member sends approval email to EC Lead.
- RRT review is complete.
- EC Lead or sponsor gets NMFS Hydro approval [where needed]. This can be concurrent with RRT review.
- EC Lead submits completed PNF Form to USFWS and/or NMFS.
- HIPIII coverage is complete.

What is the review process for high-risk projects, and how long does it take?

Sponsor provides conceptual designs to EC Lead.
EC Lead makes risk determination.
EC Lead provides to sponsor:

- Latest version of Project Notification Form (PNF)
- Latest version of Project Completion Form (PCF)
- Conservation Measures Checklist
- General Project and Data Summary Requirements Checklist (GPDSR)

Sponsor signs checklists, submits information requirements, and fills out PNF Form.
EC Lead submits project to RRT.
RRT technical review begins (total duration: 2-8 months).

- ECL or RRT to schedule site visit at 10% (or conceptual) design
- ECL or RRT will provide interagency comments to sponsor (approximately 6 weeks).
- Sponsor incorporates comments into design and resubmits at 30% (2 months).
- ECL or RRT POC will provide interagency comments to sponsor (approximately 6 weeks).
- Sponsor incorporates comments into design and resubmits at 80% (2 months).
- ECL or RRT POC will provide interagency comments to sponsor (approximately 6 weeks).
- Sponsor incorporates comments into design (if needed).
- Final approval from Services is granted.
- RRT member sends approval email to EC Lead.

- RRT review is complete.

EC Lead or sponsor gets NMFS Hydro approval [where needed]. This can be concurrent with RRT review.
EC Lead submits completed PNF Form to USFWS and/or NMFS.
HIPIII coverage is complete.

Is RRT review the same as NMFS Hydro Review?

No. NMFS Hydro review is required for a slightly different subset of projects, generally for any project that affects fish passage or involves channel-spanning instream structures. See next page for more information.

How to expedite the RRT Process?

The number 1 way to expedite the RRT process is to have the GPDSR and all supporting documentation provided to the RRT lead.

The NMFS Hydro-Division Review Process.

NMFS Hydropower Division shall conduct reviews for fish passage on any in-stream project that may result in alterations or changes in fish passage. Fish passage review is initiated by the EC Lead and usually occurs at the 60% design review juncture.

1. Fish Passage Restoration:

Profile Discontinuities Category:

a. Dams, Water Control or Legacy Structure Removal.*

YES, small dams with a maximum total head measurement greater than 3 feet, channel spanning weirs, earthen embankments and spillway systems.

b. Consolidate, or Replace Existing Irrigation Diversions.*

YES, irrigation diversion structures greater than 3 feet in height that are to be removed or replaced.

c. Headcut and Grade Stabilization.

YES, installation of boulder weirs, roughened channels and grade control structures that are above 18 inches in height.

d. Low Flow Consolidation.

YES, all projects with that as the primary intent and using artificial means.

e. Providing Fish Passage at an Existing Facility.

YES, fish Passage improvements at an existing facility that are not upkeep and maintenance such as re-engineering improperly designed fish passage or fish collection facilities, installation of a fish ladder at an existing facility, or other activities that are not upkeep or maintenance.

Transportation Infrastructure:

f. Bridge and Culvert Removal or Replacement.*

NO Hydro Review Required

g. Bridge and Culvert Maintenance.

NO Hydro Review Required

h. Installation of Fords.

NO Hydro Review Required

2. River, Stream, Floodplain, and Wetland Restoration.

a. Improve Secondary Channel and Wetland Habitats.

NO Hydro Review Required

b. Set-back or Removal of Existing, Berms, Dikes, and Levees.

NO Hydro Review Required

c. Protect Streambanks Using Bioengineering Methods.

NO Hydro Review Required.

d. Install Habitat-Forming Natural Material Instream Structures (Large Wood, Boulders, and Spawning Gravel).

NO Hydro Review Required

e. Riparian Vegetation Planting.

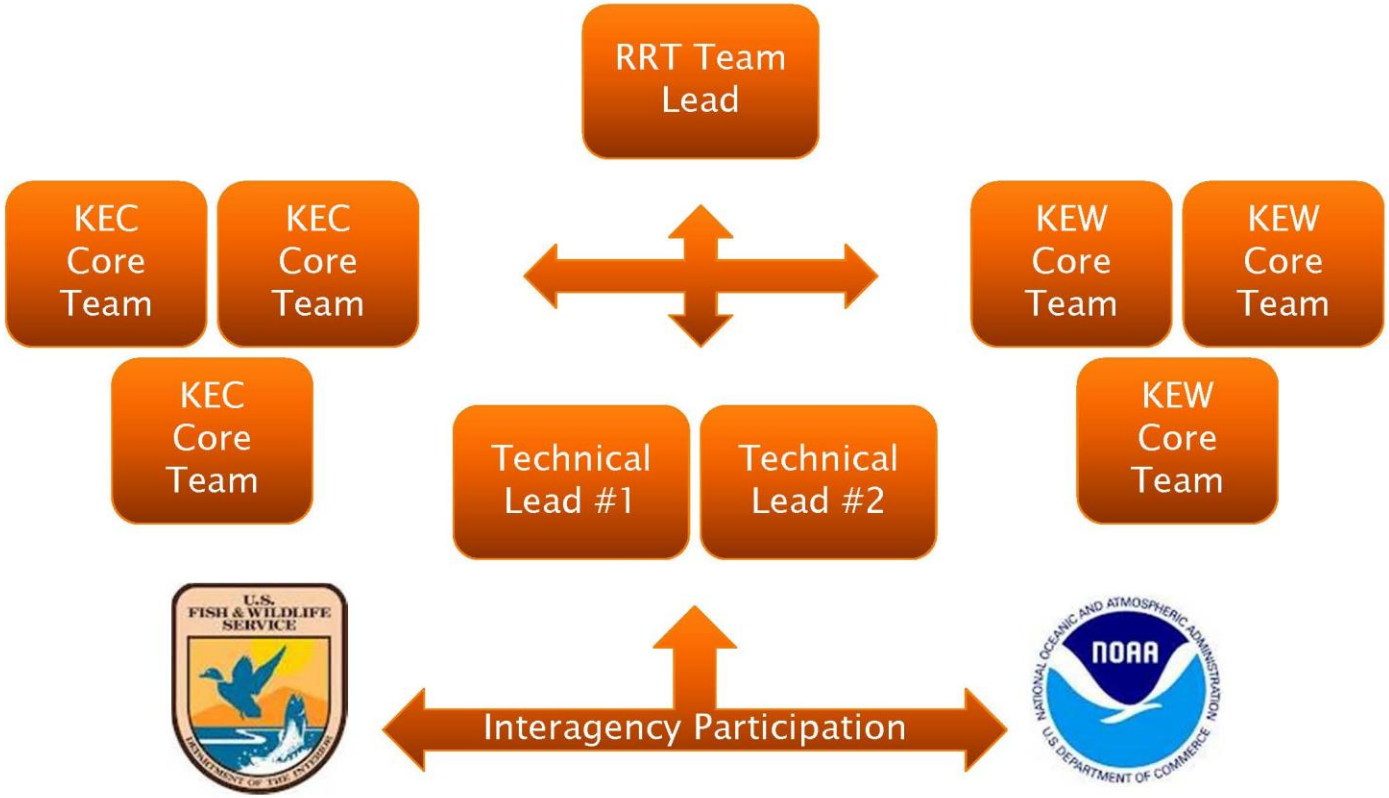
NO Hydro Review Required

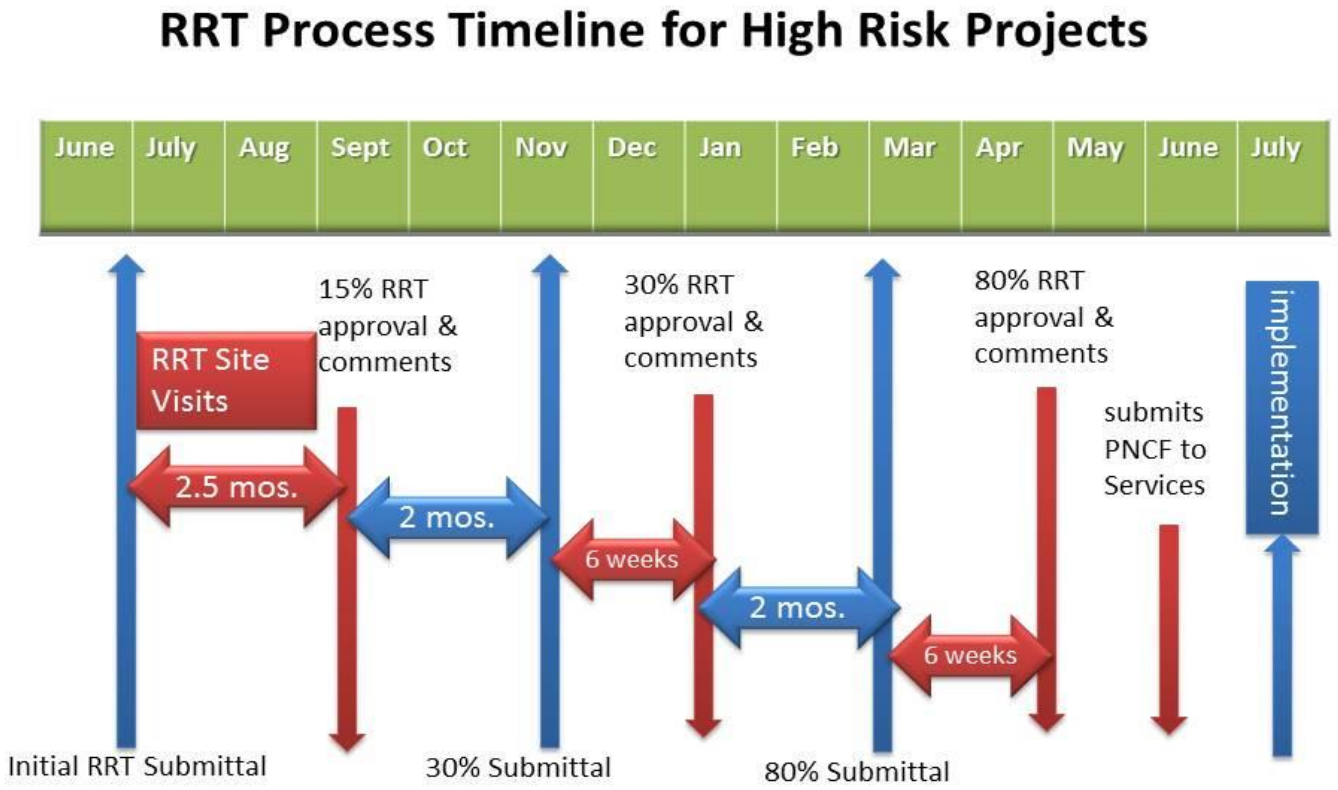
f. Channel Reconstruction.

YES, Hydro Review Required

These activity categories may result in headcut or grade stabilization
****In addition, any fish screen with pumping rate that may exceed 3cfs.***

RRT Interim Organization





**Blue indicates project sponsor action, red indicates BPA RRT action.*
***BPA typically has review milestones at 15% (conceptual), 30%, and 80%, although these junctures may be adjusted to align with our partner's processes and with respective project management plans.*

Work Element by HIPIII Risk Category.

ID	Work Element Name	Definition	HIPIII Category	RRT Review Needed	HIPIII Risk Level
29	Increase Instream Habitat Complexity and Stabilization	Work that adds natural materials instream to create habitat features or to improve channel morphology. Includes J-hooks, barbs, vortex weirs, and large woody debris (LWD). Can include work to stabilize or maintain a streambank, such as riprap, or improve complexity by creation of pools or fish spawning habitat by addition of gravel.	2d	✓	Low-Med-High
30	Realign, Connect, and/or Create Channel	Active attempts to directly add sinuosity, meanders, side channels, and/or off-channel habitats (e.g., sloughs or oxbows). May include reconnection of historical channels (either via excavation or diversion of existing streamflow), excavation of new channels, and/or significantly improving the functionality of existing channels (e.g., creating a "natural" spawning channel for chum).	2d, 2f	✓	Med-High
33	Decommission Road/Relocate Road	Any activity that makes a road or trail unusable including adding berms, pits, boulders or logs, and/or ripping, scarifying, recontouring, or obliterating the road or trail with heavy equipment that may involve re-contouring the slope. Also use for building a road or trail in a more appropriate location to replace a decommissioned road or trail.	5b		Low
34	Develop Alternative Water Source	Provision of water supply for livestock that is out of the water zone and at a distance beyond that which may affect the conditions of the water body. Includes, but not limited to, watering troughs, spring and well development, and guzzler installation.	7f		Low
35	Develop Pond	Develop a pond and its surrounding habitat for resident fish and/or waterfowl. May involve the installation of a water control structure or excavation.	2a	✓	Med
36	Develop Terrestrial Habitat Features	Includes the installation and/or creation of structures for the benefit of wildlife species, including, but not limited to, nest boxes/platforms, avian perches, snags, guzzlers, and artificial roosting sites.	9a		Low
38	Improve Road	Work designed to eliminate or reduce erosion, sediment, and/or toxic run-off from reaching streams, rivers, or wetlands from roads or trails currently in use. This includes road projects that reduce or eliminate inter-basin transfer of water, placement of structures to contain/ control run-off from roads or trails, road or trail reconstruction or reinforcement, surface and peak-flow drainage improvements, and roadside vegetation. These roads may be in or extend into the riparian zone.	5a		Low
40	Install Fence	Work to install various types of fence and/or gates for habitat improvement.	9b		Low
44	Enhance Nutrients in Water Bodies	Addition of fish carcasses, or direct nutrient introduction methods to improve biological diversity in streams, rivers, or lakes.	6		Low
47	Plant Vegetation	Use during the first year (and only first year) of planting terrestrial or aquatic vegetation and/or applying seed (aerially, mechanically, and/or by hand) for purposes such as: wildlife cover and forage enhancement, erosion control and soil stabilization (run-off reduction and other soil destabilizing processes and activities not related to restoration after construction of facilities such as passage structures, buildings, or fish hatcheries), roughness recruitment, shading, restoration of native habitat, restoration after wildfires, and rehabilitation of removed roads/trails.	9d, 9c		Low
55	Erosion and Sedimentation Control	This is work that occurs in the riparian and upland zones, which may include the installation of water bars, gully plugs and culvert outlets, grassed waterways, grade stabilization structures, sediment catchment ponds/basins, regrading or terracing, and removal of drainage pipes and other blockages specifically to prevent erosion, sediment slumps, or landslides.	9c		Low

180	Enhance Floodplain/Remove, Modify, Breach Dike	Refers to the removal, breaching, or alteration/set-back of a dike to restore riparian/floodplain or wetland habitat. Also includes re-contouring of habitat to restore or enhance wetland or floodplain functionality and connectivity.	**2a, 2b**	✓	**Med-High**
181	Create, Restore, and/or Enhance Wetland	Refers to the creation, restoration, or enhancement of a wetland area or function. This may be from the installation of a water control structure, re-contouring, and excavation to improve habitat connectivity.	**2a**	✓	**Med-High**
199	Remove Vegetation	Use during the initial year of treating a site if removing one or more plant species, or a number of individuals of a plant species, by mechanical, biological, and/or chemical means, or by controlled burn.	**3a, 3b**		**Low**
27	Remove Debris	Removal of items such as trash, old buildings, and abandoned equipment from water or land. Does not include removal of a diversion or instream structure.	**4**		**Low**
198	Maintain Vegetation	Maintain planted or pre-existing vegetation through physical, chemical, mechanical, and/or biological activities such as scalping, installing mats or mulch, mowing, irrigating, fertilizing, applying herbicide(s), burning, using Integrated Pest Management (IPM), preventing or reducing animal damage (browse repellents, tree tubes). This includes using different, or the same, treatment techniques in previously treated areas the second year, or later, of planting.	**3a, 3b**		**Low**
69	Install Fish Screen	Work to install or replace a fish screen associated with a diversion or pump. Typical screen types include rotary drum, flat plate or traveling.	**7g**		**Low**
80	Install Siphon	Covers work that installs a siphon, flume, or other structure to separate canal flow from stream flow where the two have been intermingled as part of past water diversion development, resulting in fish using the natural stream course for passage and rearing.	**7e**		**Low**
84	Remove/Install Diversion	Work that removes, replaces, or avoids creating a fish passage barrier associated with a stream diversion, including push-up dams. May be part of a diversion consolidation effort that reduces the number of diversion sites.	**1b**	✓	**Med-High**
85	Remove/Breach Fish Passage Barrier	Work that facilitates fish passage over a natural (e.g., beaver) or human-made barrier by breaching or removal. This includes dams, weirs, fish ladders, tidegates, culverts, bridges, and road crossings.	**1a**	✓	**Med-High**
184	Install Fish Passage Structure	Install, replace, or modify structures when the intent is to improve fish passage and/or flow, typically by removing or modifying a full or partial instream barrier.	**1e**	✓	**Med-High**
82	Install Well	Install well to enable groundwater to be used for irrigation as an alternative to instream flow.	**7c**		**Low**
149	Install Pipeline	Includes activities related to installing a pipeline . This work element is only for work designed to provide irrigation efficiencies which result in increased instream flow	**7b**		**Low**
150	Install Sprinkler	Includes activities related to installing a sprinkler system. This work element is only for work designed to provide irrigation efficiencies which result in increased instream flow.	**7a**		**Low**
151	Line Diversion Ditch	Includes activities related to lining a ditch. This work element is only for work designed to provide irrigation efficiencies which result in increased instream flow.	**7b**		**Low**